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Number 5.

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and
Industrial
Record.

1900 EDITION

TEXTILE WORLD'S

OFFICIAL DIRECTORY

OF THE

Textile Manufacturers of the United States.

448 PAGES. 22 MAPS.

Price, $2.00.

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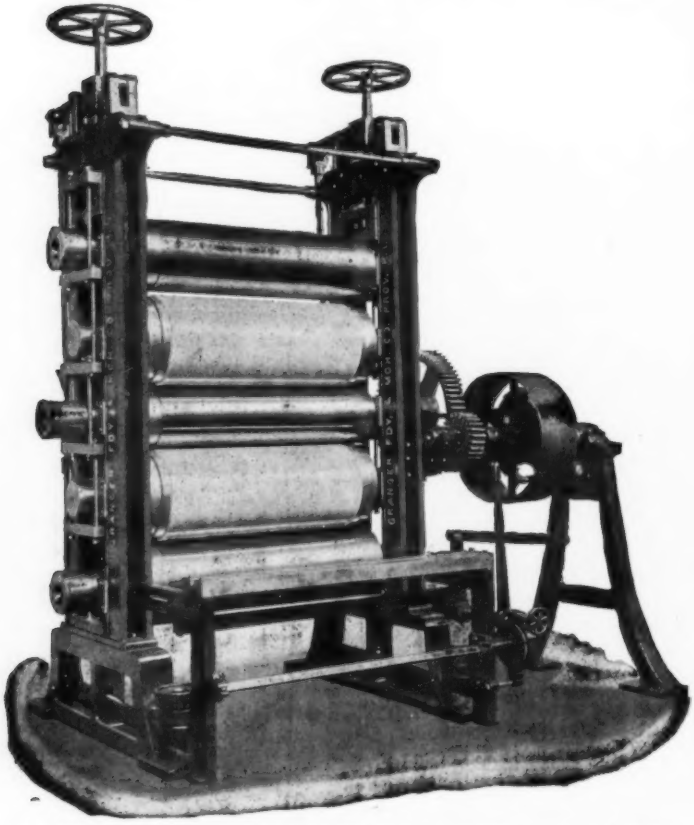
GUILD & LORD,
PUBLISHERS.

620 ATLANTIC AVENUE,
BOSTON, MASS.

Bleaching, Dyeing, Drying,

And Finishing Machinery.



CALENDERS, MANGLES AND ROLLS.

TENTERING MACHINES,
MERCERIZING MACHINES.

Granger Foundry and Machine Co.

PROVIDENCE, R. I.

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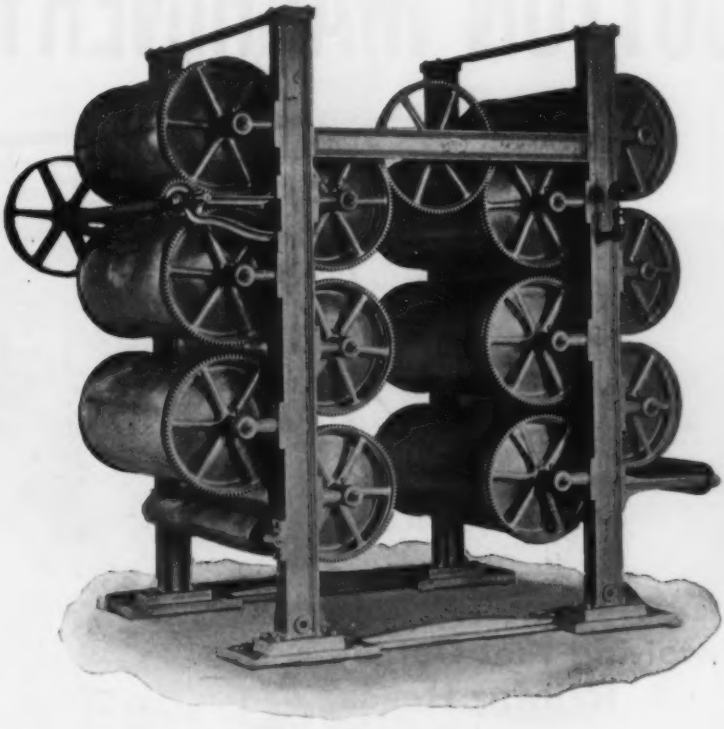
For Textile Fabrics



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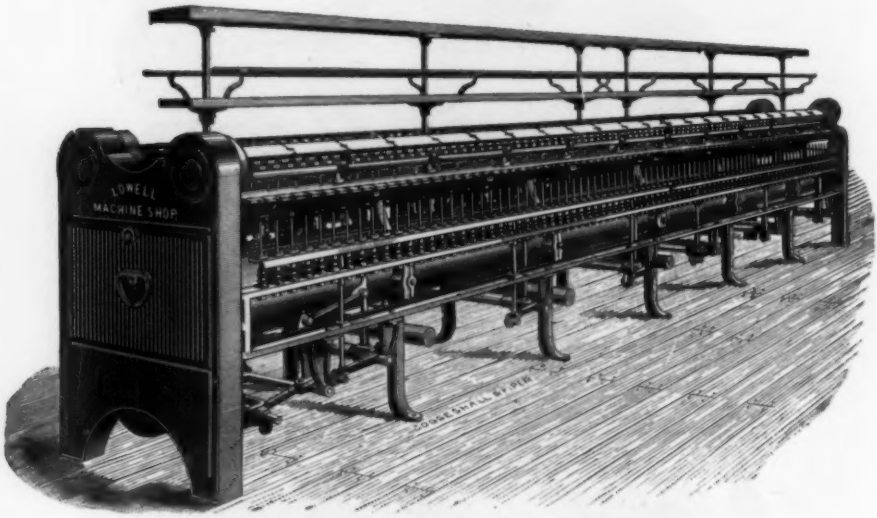

Revolving Flat Cards,
Railway Heads,
Drawing Frames,
Roving Frames,
Ring Spinning Frames,
Twisters, Spoolers,
Warpers, Slashers,
Looms.

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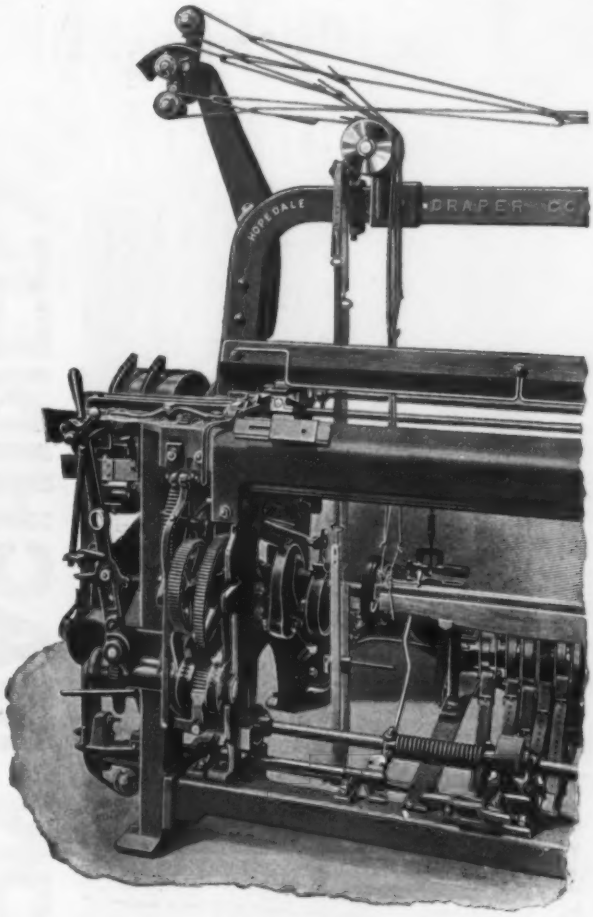

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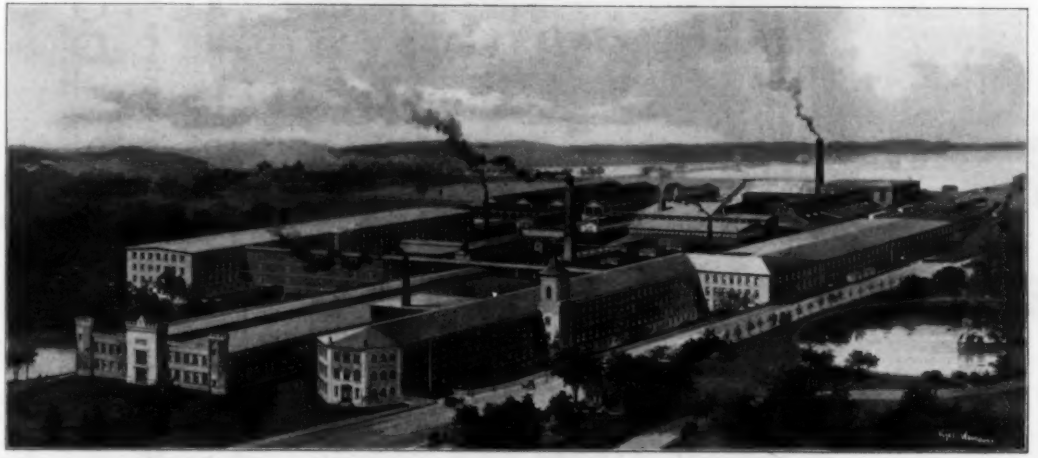

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SLUBBING FRAMES
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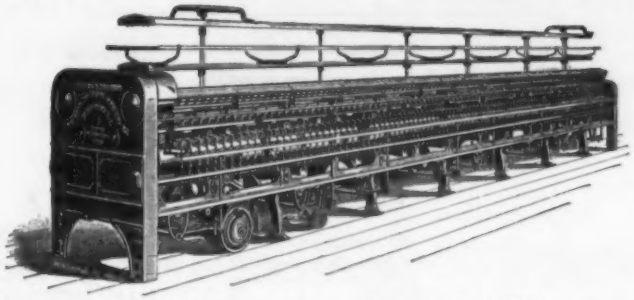

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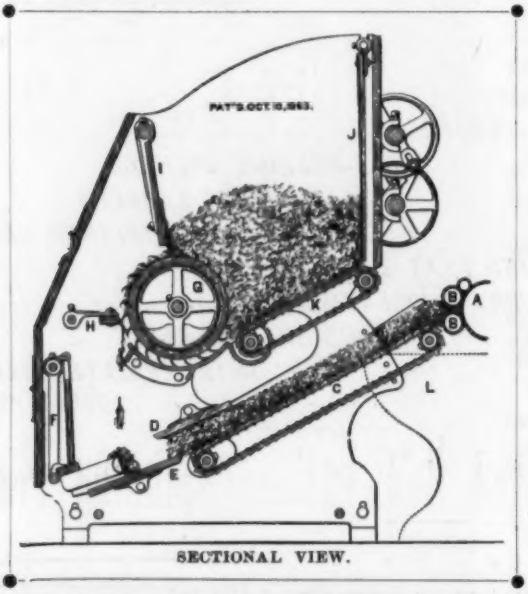

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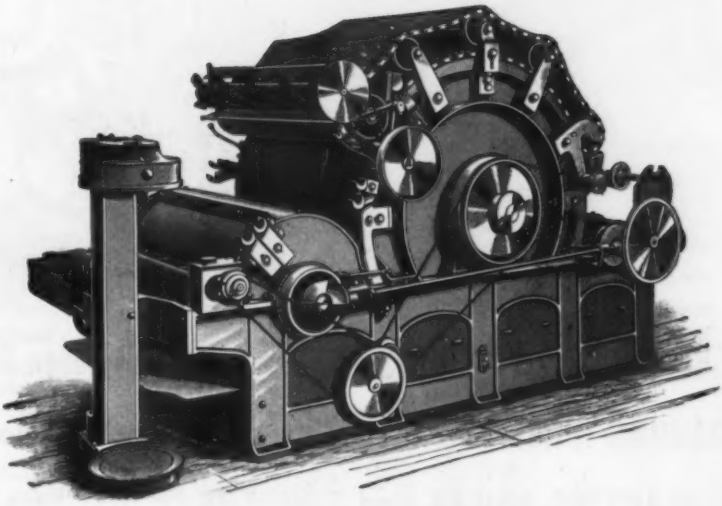

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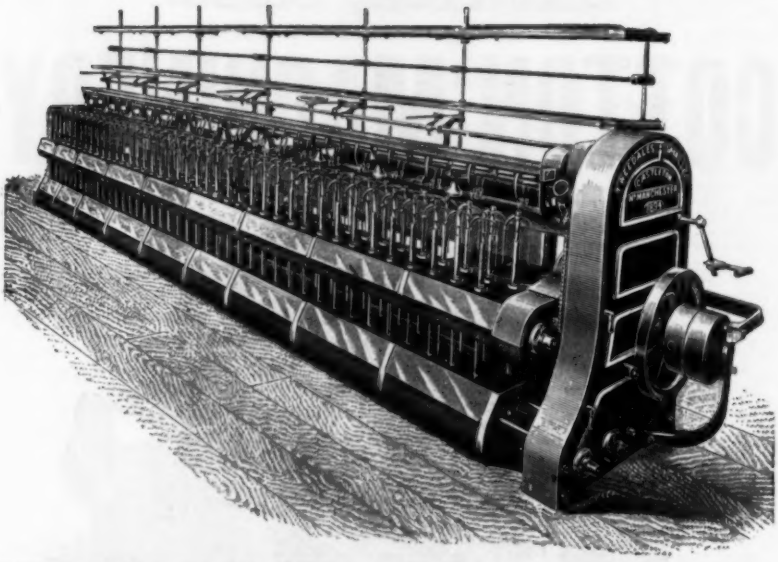

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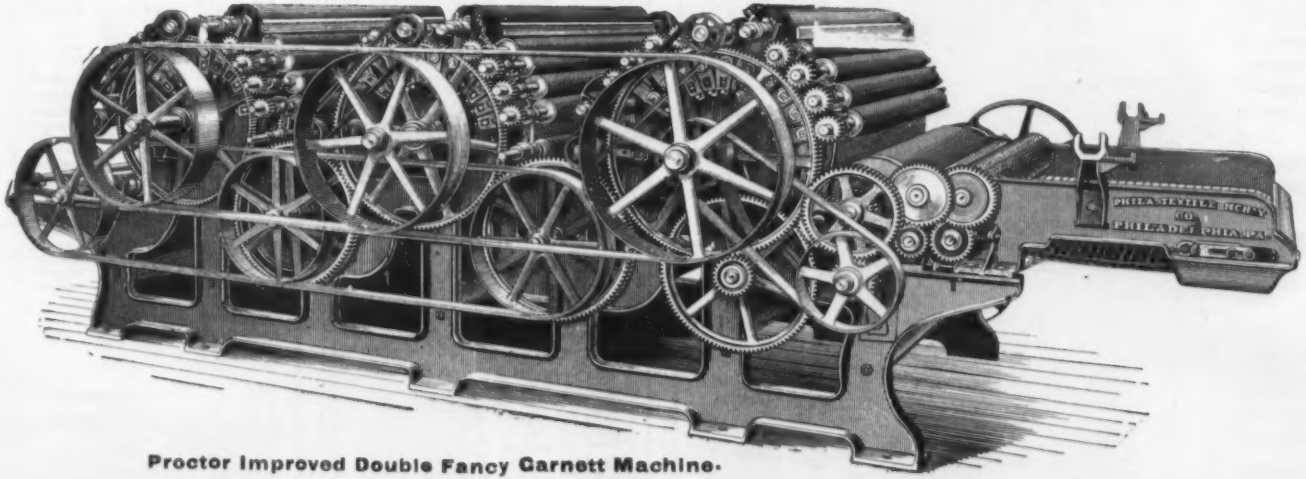

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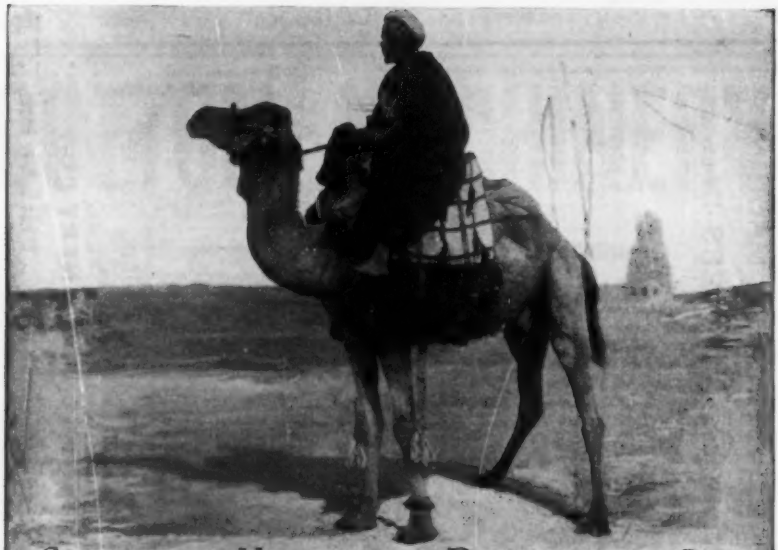

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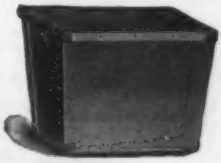

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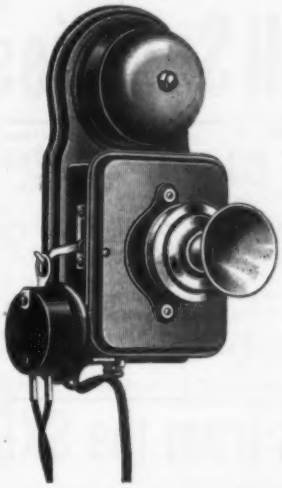

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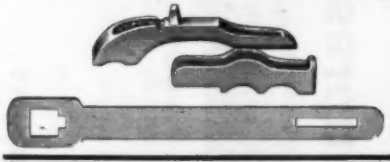

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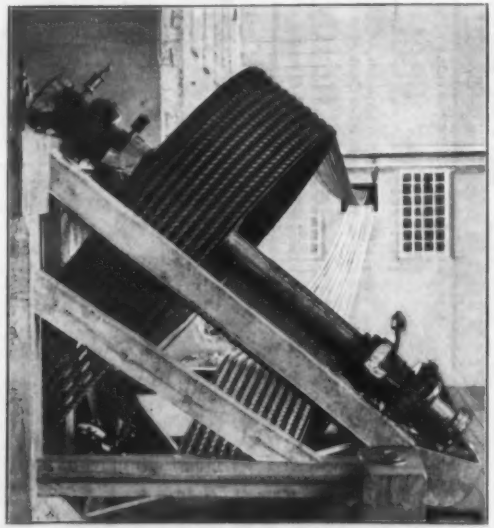

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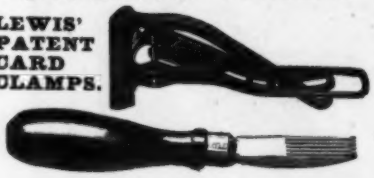

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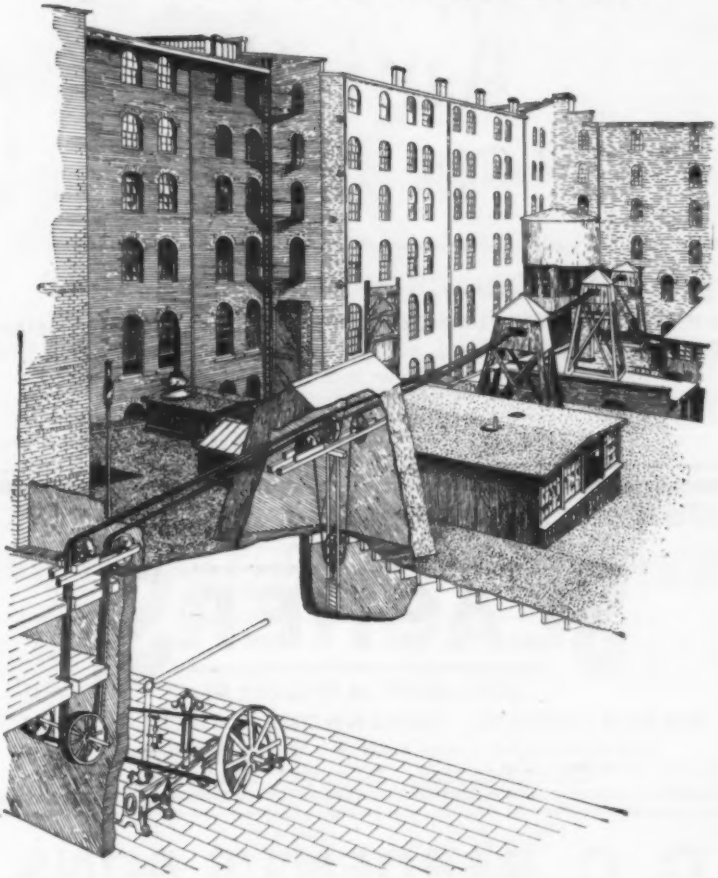

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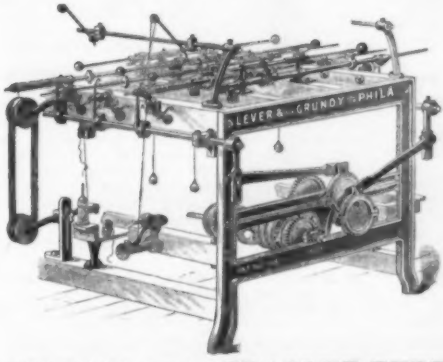

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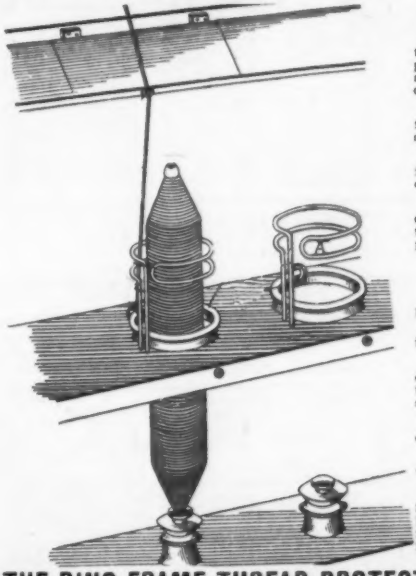

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5. Frame and rail more perfectly balanced.

6. Heavier travelers can be used.

7. The yarn is wound tighter and more uniformly on bobbins.

8. A material saving in time of doffing, as more yarn is wound on, and longer bobbins can be used.

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Practical Mechanics for Textile Workers. By George R. Smith, 235 pages.

This is a valuable work on mechanics, pertaining to textile factories. It is written by the assistant lecturer and demonstrator in carding and spinning, Yorkshire College, Leeds. The book deals with measurements, which all mill men should be able to take accurately; with the units and apparatus employed in estimating heat, work and power; the disturbing influences in a machine which go towards making a machine what it is; cams, levers, pulleys; gears, shafting, belts; transmission of power; hydraulics; boilers, fuel, motive power, etc. Price $2.50.

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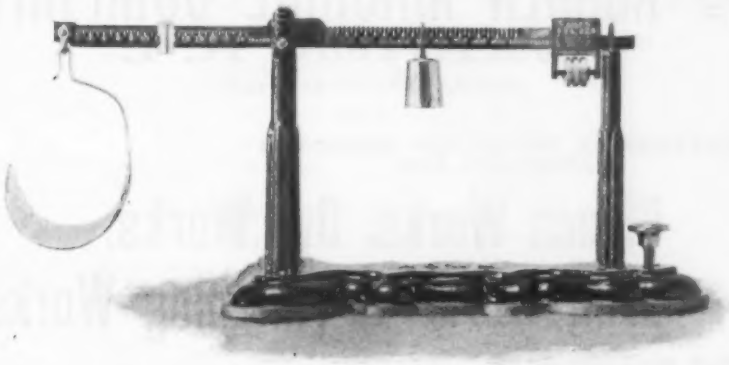

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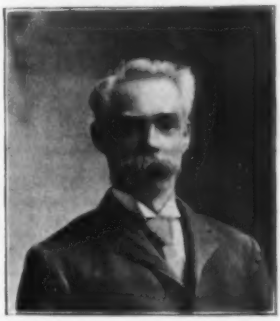

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List of Textile Patents.

Issued October 2, 9, 16 and 23, 1900.

Bobbin, Separable Cone. 659,597. W. P. Wood and W. E. Emery, Pawtucket, R. I.

Carding Machine Feeding Device. 659,240. T. Lee, Philadelphia, Pa.

Cloth Cutting Apparatus. 659,119. M. A. Adler, New York, N. Y., assignor to C. S. Adler, same place.

Cotton Opener. 659,986. G. Raetz, Pordenoue, Italy.

Cotton Picker, Pneumatic. 659,752. W. H. Mevers, Sturgis, Ky., assignor of one-half to G. W. Pritchett, Corydon, Ky.

Dyeing. 659,343. J. W. Fries, Salem, N. C.

Dyeing. 659,556. A. Siegmund, Ludwigshafen, Germany, assignor to the Badische Anilin and Soda Fabrik, same place.

Dyeing Apparatus. 660,402. N. L. Smith, Waterford, N. Y.

Dyeing Machine, Yarn. 659,906. L. Weldon. Amsterdam, N. Y.

Fibrous Materials, Apparatus for Cleansing. 659,879. A. Ubbelohde, Celle, Germany.

Flax Machine. 659,342. D. S. Eastwood and N. H. Normand, New Bedford, Mass., assignors, by mesne assignments to the National Flax Fibre Co., Boston, Mass.

Heddles, Treating Worn Out. 659,715. E. Themaus, Enschede, Netherlands.

Knitting Machine. 658,826. E. Boessneck, Chemnitz, Ger., assignor to C. H. Aldridge, Loughborough, Eng.

Knitting Machine, Lace. 660,053. C. E. Drew, Philadelphia, Pa., assignor to the Friedberger Mfg. Co., of Pennsylvania.

Loom. 659,950, 659,951, 659,952. Wm. H. Baker, Central Falls, R. I. and Frederic E. Kip, Montclair, N. J.

Loom. 659,628. C. F. Roper, Hopedale, Mass., assignor to the Draper Co., same place and Portland, Me.

Loom. 660,441. A. Insinger, Philadelphia, Pa., assignor to the Insinger Company, same place.

Loom Heddle Attachment. 658,961. O. Runge, Passaic, N. J.

Loom Jacquard Mechanism. 659,364. J. Dean, Paterson, N. J.

Loom Let-Off Motion. 659,205. J. C. Bryan, Augusta, Ga.

Loom Picker Mechanism. 659,072. E. M. Keffer, Hespeler, Can.

Loom Reed. 660,162. W. F. Luther, Fall River, Mass.

Loom Shuttle. 659,435. L. W. Campbell, Woonsocket, R. I., assignor of one-half to Malcolm Campbell, Boston, Mass.

Loom Shuttle Motion. 659,405. R B. Loynd. Philadelphia, Pa.

Spool or Bobbin. 659,306. J. D. Kingsland, New York, N. Y., assignor of one-half to A. D. Zeigler, same place.

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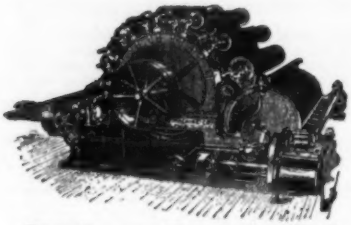

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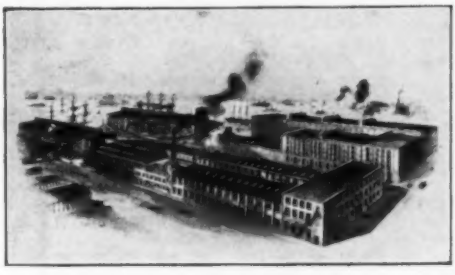

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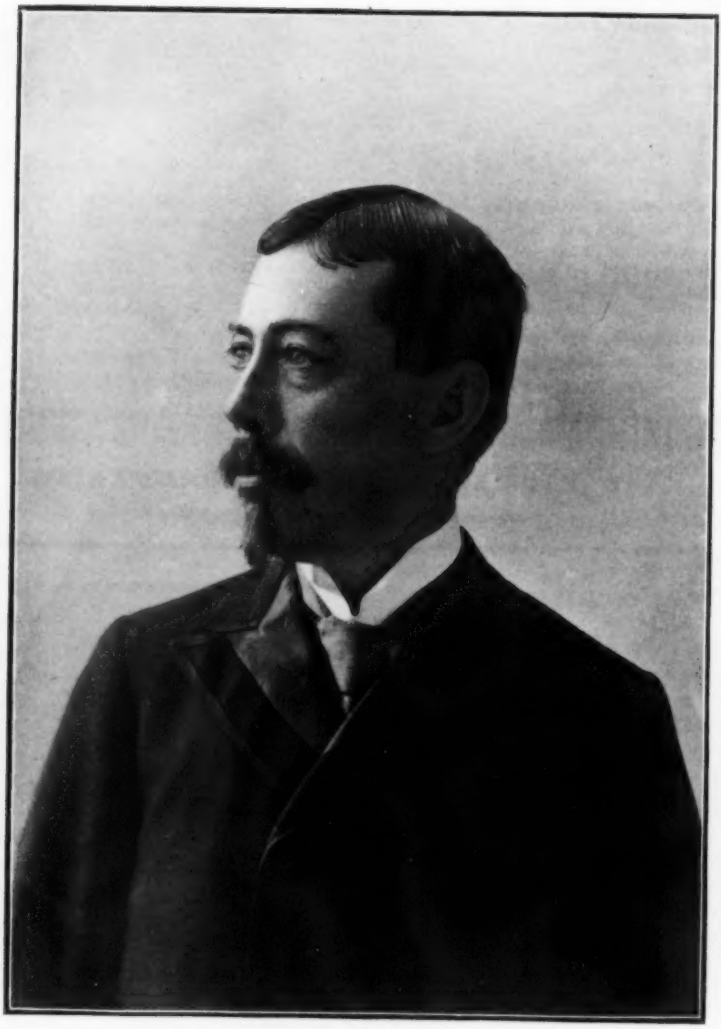


EDWARD A. GREENE.

TEXTILE WORLD.

Vol. XIX. NOVEMBER, 1900. No. 5.

EDWARD A. GREENE.

Edward A. Greene was born in Central Falls, R. I., February 9th, 1845. His early education was obtained in the public schools of that city, and later he took a course of instruction in a business college at Providence, preparing himself for his future business career.

Upon leaving this college, he went to work as clerk in the office of Greene & Daniels, of which firm his father was senior partner. He applied himself closely to mastering the details of the business, and after four years of faithful service in this position, he decided to take a trip abroad to study manufacturing methods and machinery in other countries.

The information thus acquired was of great value, and he returned home to carry out the ideas and suggestions which he had received from examination of foreign cotton mills and machine shops.

In 1876, the firm of Greene & Daniels was incorporated under the name of The Greene & Daniels Manufacturing Company, and the subject of this sketch was elected treasurer, a position for which his previous training well fitted him. In the wider field of action which this position afforded him, he showed a high order of executive ability, and for ten years successfully managed this department of the business.

In 1886, he succeeded to the office of president, made vacant by the death of his father. Nine years later, when the treasurership became vacant, Mr. Greene assumed the duties of that position, and until his death filled the positions of both president and treasurer. His broad business capacity is conclusively shown by the fact that in addition to the extensive and arduous duties in connection with the Greene & Daniels Manufacturing Company, he became interested in many outside enterprises, to which his business experience and advice was of great value. He was a director in the Slater Trust Co., the Kent-Stanley Co. of Providence, the Atlantic Mutual Fire Insurance Co., the Pawtucket Mutual Fire Insurance Co., the River Spinning Co. of Woonsocket, R. I., and a trustee of the Franklin Savings Bank of Pawtucket.

In 1861 he became a private in the Home Guard, serving until 1865, and for five years was quartermaster of the Union Guards of Central Falls. He also served as commissary with the rank of major, on the staff of Gen. Horace Daniels.

Mr. Greene was not only a successful business man, but also a public-spirited citizen, having a deep interest in every enterprise to promote the general welfare.

His death occurred on the 8th of last July, while he was taking a brief respite from work, and while still in the prime of life and fulness of his powers. He is survived by a wife and three children.

Mr. Greene fulfilled in his lifetime every obligation laid upon him, and his memory will be long treasured by family, friends and business associates, who admired and trusted him for his sterling qualities and marked ability.

THE ELECTION.

For four years more the country is assured of a continuance in power of the present administration. The policies to which it is committed, are known. Its probable action on many questions can be predicted with a fair degree of accuracy. First of all, the monetary standard, the basis of exchange in both domestic and foreign trade, will be undisturbed. The tariff now in force will be continued, and American industries which have come into existence and grown to vast proportions under protection, will not be subjected to the shock and disturbance of a change of tariff rates, either up or down.

The emphatic manner in which the voters have expressed their disapproval of the policy of change, is not the least cause for congratulation. It is a plain notice to the party seeking power, that they cannot attain their object by advocating experiments that all human experience declares would be followed by disaster. The people have settled these issues in such a way that they will stay settled for some time to come.

No industry will be more benefited by these results than that of textile manufacturing, which has in the past suffered so much from political experiments. But, while it has been saved from threatened perils, it would be most unwise to conclude that because of this victory from now on prosperity is certain to come to our looms and spindles. No fact has been more conclusively demonstrated during the past two years than that in most branches the productive capacity of the textile machinery in the United States is in excess of domestic demand. The election has not changed that. It has simply assured our manufacturers that they can devote themselves to finding an outlet for the surplus, without contending at the same time with free silver and tariff tinkering.

Our cotton, woolen, silk, and knitting mills need wider markets. How they are to be obtained, is a question for manufacturers to meet, and while they can rely on the co-operation of the administration in power, it is chiefly upon their own efforts to reduce cost of their products and to capture foreign markets that they can hope to avoid the evils of domestic over production. This applies to every branch of textile manufacturing. We can make more cotton, woolen, silk, and knit goods than we need. The election is settled as desired. Now let us go to work and meet the difficulties which are still with us.

The immediate effect will doubtless be stimulating. Orders contingent on election will be placed and idle machinery put in motion. The textile trade wants no boom, but hopes for permanent good business on a conservative basis.

UNION FACE CLOTHS.

In another part of this issue appears an article from an English writer on Dewsbury low grade goods. English manufacturers stand at the head of the procession in the manufacture of fabrics from rags and cotton.

Surprising results in the finished fabric are obtained from the use of rags as raw material, and form a striking illustration of the result of long continued effort in the manufacture of one class of goods.

We will in this article consider more particularly the cotton warp union as made by the most approved methods. American manufacturers are, with one or two exceptions, far behind in the working of rags and cotton. There is, however, at least one concern in this country that at the expense of much time, money and effort, and by applying themselves exclusively to the manufacture of cotton warp face cloths, have succeeded in turning out a product of the first rank. These goods are used for covering caskets, and in the manufacture of caps, etc.

Many attempts have been made by other mills to make these goods, but have failed because it is absolutely necessary for success, that no other fabric be made in the mill, that the carding, spinning and finishing machinery should be specially adapted to the fabric, and that the operatives should possess special knowledge and skill.

No photograph can give any idea of the fabric, as the face is plain and face finished. The illustration which we give is taken from one of the fabrics made by the concern previously referred to. The cloth is shown both before and after the wool stock has been boiled out. The small sample pinned to the larger one, consists of the cotton warp and the small percentage of cotton mixed in the filling.

There is no room for other manufacturers in this country on this particular line of goods. The trade is well supplied by the three firms now in the business, but we show the goods to call attention to the possibilities in the manufacture of other fabrics by perfecting our present methods for working rags and cotton.

The cloth shown in illustration has about 51 threads of 2/40 cotton per finished inch in the warp, and 44 picks of 2½ run yarn per finished inch in the filling. This filling is made from a mixture of 10 per cent. cotton and 90 per cent. fine shoddy. Sometimes a small percentage of wool, say 5 per cent., is used in the filling.

In the carding and finishing of these goods, are found the distinguishing features of this branch of manufacturing. The cards are very wide, 70 inches, and so built as to expose the stock to a large carding surface. Special feeds are provided for handling the tender sliver, and special doffers

UNION FACE CLOTH.

are used on the finisher.

The results are such as would astonish the average manufacturer of woolen yarn. A smooth, fairly strong thread is produced, with the fibres combed out straight and clear, making a cloth with a smooth, level face, to which a skilled finisher can give a face finish of a high order.

The cloth illustrated weighs 14 8/10 ounces per yard, 70 inches wide, is woven with a plain weave, sells for 85 cents per yard, and 31 per cent. of the finished weight is cotton. The methods of carding and spinning used in the manufacture of these cloths should be studied by our manufacturers of low grade goods, such as cheviots, beavers, kerseys, friezes, etc. The process is, with slight modifications, adapted to the working of cot-

ton waste, of which we have heard so much of late. We will not speak now of the finishing, as it is the carding process that our readers can study with a view of improving the manufacture of other fabrics.

It is incumbent on woolen manufacturers to adopt the most approved methods, in order to meet the competition from both home and foreign sources, and keep step with the tendency towards lower prices, which is found in all industries.

WOOL MARKET.

The wool market in October maintained the reputation for dullness and falling prices that it had acquired since the beginning of 1900.

The failure of a large Philadelphia wool house, and the discouraging offer of settlement, while bad enough in itself, was chiefly important as indicating the precarious condition to which a part of the wool trade had been brought by the boom of 1899, and consequent reaction. It was currently reported that other firms would have been seriously embarrassed, if the banks who were carrying their paper had not granted an extension. It had been well understood for months that the forcing of any large lot of wool on the market would have caused a bad break in prices.

The London sales opened at a decline of 10%, and sales have been unsatisfactory. The decline in wool is world wide. On the Continent, as well as in England, the same conditions are found, and in spite of elections or tariffs, our wool values will reflect to some extent the condition of supply and demand in other lands.

While the sales for the month show an increase, they are still far below a normal volume.

The light weight season has been a failure. Mills have either shut down or run in part with greatly reduced consumption of raw material.

The October decline in wool prices has not been accompanied by large sales, although the closing weeks were marked by considerable speculative activity.

Owners of wool have, with few exceptions, been very firm, and shown the greatest confidence in the future. As a demand for wool has been in a great measure lacking, the result is that weak holders have found it necessary to make lower prices, and our chart records a decline of fine medium to 45 cents. The month closed with a somewhat improved demand, caused by the prospect of a Republican victory at the polls.

This expectation has since been ful-

filled, and while the result will undoubtedly strengthen the market, there is a feeling on the part of many in the trade that any decided advance in quotations is likely to be checked by the large stocks which have been carried for months, in the hope that they could be sold to better advantage after election.

Manufacturers have few orders, and are not likely to encourage any booming of prices by purchasing wool they do not need.

EXPORTS AND IMPORTS OF RAW WOOL, YARN AND WASTE.

Lbs. in units of one million. Value in units of $ 00,000.

Year Ending June 30.	Exports.		Imports.					
	Wool.		Wool.		Shoddy, noils, etc.		Yarn.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
1890	.231	.335	106.3	152.6	5.0	20.5	3.5	19.9
1891	.291	.394	129.3	182.4	1.2	4.3	2.0	11.9
1892	.202	.306	148.7	196.9	.3	.9	1.3	7.5
1893	.091	.148	172.4	210.6	.3	1.1	1.2	6.9
1894	.520	.906	55.2	61.1	.1	.5	.5	3.6
1895	4.289	4.844	192.8	229.9	14.1	19.8	2.4	11.7
1896	6.945	8.559	228.4	305.0	18.7	26.5	2.0	10.5
1897	5.271	6.199	366.6	567.5	49.9	69.3	1.8	9.6
1898	.121	.180	132.8	167.8	3.3	6.9	.3	1.9
1899	1.683	2.373	76.7	83.2	.3	.7	.2	1.1
1900	2.200	3.872	155.9	202.6	.4	.9	.2	1.3
July	.001	.002	7.7	10.6	.017	.059	.018	.132
Aug.	..	..	6.8	9.2	.047	.182	.022	.161
Sept.	..	..	7.2	7.9	.033	.127	.019	.132

EXPORTS AND IMPORTS OF MANUFACTURED WOOLENS.

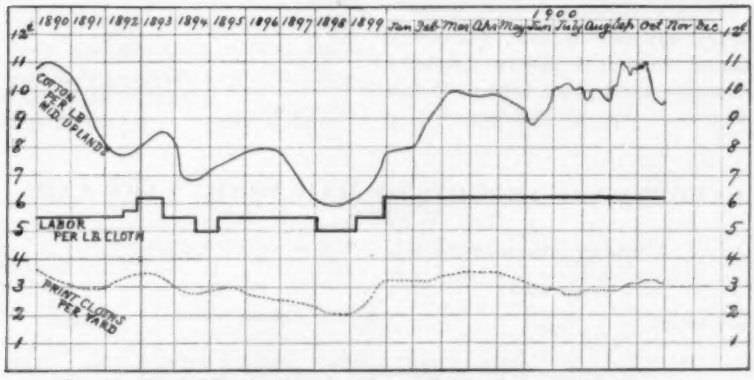
Value in units of $100,000.

Year Ending June 30.	Exports — Value.						Imports — Value.							
	Carpets.	Dress Goods.	Flannels and Blankets.	Apparel.	Other.	Total	Carpets.	Clothe.	Dress Goods.	Shawls.	Clothing	Knit Goods.	Other.	Total.
1890	.067	..	.409	3.179	.719	4.374	7.5	161.4	242.0	10.1	18.4	19.8	66.2	525.4
1891	.184	..	.265	4.240	.502	5.191	13.7	120.3	182.4	7.2	18.6	12.5	39.7	394.4
1892	.093	..	.244	2.689	.649	3.675	12.9	127.6	164.7	3.5	14.8	11.6	12.1	347.2
1893	.115	..	.242	2.224	.679	3.260	15.8	151.2	164.8	2.8	11.7	14.1	12.0	372.4
1894	2.500	..	.387	3.172	1.685	7.744	9.6	67.6	85.8	1.6	8.6	10.0	7.2	190.4
1895	1.610	..	.498	3.161	1.432	6.701	13.6	163.0	144.0	2.0	10.0	9.4	11.8	353.8
1896	2.252	..	.370	3.653	2.860	9.135	8.9	218.9	199.3	4.5	13.0	25.4	27.4	497.4
1897	1.895	..	.573	3.858	3.150	9.476	7.8	170.1	167.9	4.6	9.8	25.3	27.0	412.5
1898	1.612	.414	.474	4.290	4.074	10.89	17.9	89.6	60.4	.4	7.6	3.9	9.6	139.4
1899	.811	.169	.427	5.388	3.679	10.47	17.6	39.1	59.1	.5	8.3	6.3	5.6	136.5
1900	1.150	.244	1.002	5.654	4.485	12.54	27.5	51.3	58.7	.8	9.9	5.0	6.3	159.5
July	.076	.004	.058	.429	.488	1.055	3.02	7.25	8.52	.07	.06	.46	.55	19.93
Aug.	.084	..	.146	.736	.726	1.682	2.77	5.85	6.24	.15	1.79	.42	.48	17.68
Sept.	.028	.024	.014	.738	.628	1.432	2.12	2.56	2.34	.06	2.73	.68	.45	10.94

—At the recent Live Stock Show and Sale at Kansas City, there was a fine showing of Angora goats, and 2000 were sold. A yearling buck sold for $35.00, the highest price paid. More and larger animals came from Texas than from any other state. Preliminary steps were taken to organize a National Angora Goat Association.

—An Ohio newspaper devotes considerable space and scare headlines to a suit of clothes bought in a local store, which, upon examination under a microscope, as the paper states, was found to be made of a fibre composed of one-third cotton. The article gives, as an explanation, that the Eastern manufacturers have learned a new trick of putting a "tar finish" upon cotton goods to imitate wool, and ascribes the low price of wool to this cause.

COTTON MARKET.


1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900
Jan Feb Mar Apr May Jun July Aug Sep Oct Nov Dec
COTTON PER LB MID. UPLAND
LABOR PER LB CLOTH
PRINT CLOTHS PER YARD

Graphic Chart of Fluctuations in prices of Cotton, Labor and Print Cloths.

Cotton prices during October were moved up and down principally by speculative influences. The spot demand has been active both here and abroad.

No concerted action to restrict purchases could be maintained among English spinners. Many of them had made contracts which forced them to run their mills, if cotton could be bought, and the result is that every bale of the new crop sent from the United States was sold to go into consumption upon arrival. During the week ending Oct. 26, 248,838 bales were exported, as compared with 204,397 for same week last year.

The high prices prevailing have led to a heavy movement of the new crop, the immediate result being a decline of 1½ cents per lb. from the highest. This drop has been assisted by favorable Government reports as to condition and by the absence of Jack Frost from the cotton fields.

An English estimate that the world would require more cotton than had been grown, failed to check the downward movement. The general statistical position remains the same in spite of the speculative reports and movement of the commodity from place to place.

The principal factors in the situation are the size of the new crop, which depends largely upon getting it where frost cannot injure it, and upon the business conditions throughout the world.

The first influencing the supply, and the second being the controlling factor in the demand, will regulate the price of cotton for the coming year. The visible supply was reported by the Chronicle Oct. 26th as 2,394,775 bales, as compared with 3,230,344 bales at same time in 1899, 3,284,488 bales in 1898 and 2,472,915 bales in 1897. These figures, however, give no idea of the large shrinkage in mill stocks which, it is well known, has taken place during the past year.

—The Sea Island cotton growers of Lowndes, Ala., have formed an association, and it is expected that similar action will be taken in all of the sea island growing countries. The object of the association is to have the cotton sold only when a demand exists, and thus avoid sacrificing the product. Local bankers are interested and have been elected members of the advisory board. They are expected to promote the object of the association by making loans on the cotton, and the growers are considering advisability of holding their cotton for 20c per lb.

—Reports from European cotton manufacturing centers, state that mills are shutting down owing to high price of cotton and the low price and small demand for goods.

EXPORTS AND IMPORTS OF RAW COTTON AND WASTE.

Lbs. in units of one million. Value in units of $100,000.

Year Ending June 30.	Exports.									Imports.				
	Sea Island.		Other.		Total.			Cotton Waste.		Raw Cotton.			Cotton Waste.	
	Lbs.	Value	Lbs.	Value.	Lbs.	Value	Value. per lb.	Lbs.	Value.	Lbs.	Value.	Value per lb	Lbs.	Value
1890	9	23	2462	2486	2471	2509	10.15	..	..	8.6	13.9	16.16	..	..
1891	14	31	2863	2876	2907	2907	10.00	..	..	20.9	28.2	13.49	..	..
1892	19	16	2926	2568	2945	2584	8.77	..	..	28.7	32.1	11.18	..	..
1893	8	17	2204	1870	2212	1887	8.53	..	..	43.4	46.9	10.80	1.9	.8
1894	14	29	2669	2080	2683	2109	7.82	..	..	27.7	30	10.83	2.7	.9
1895	15	28	3502	2021	3517	2049	5.82	..	..	49.3	47	9.53	2.9	1
1896	19	38	2316	1864	2335	1900	8.13	..	..	55.3	66	11.93	6	2.1
1897	21	41	3082	2268	3103	2309	7.12	..	..	51.9	59	11.36	5.3	1.7
1898	16	28	3834	2277	3850	2304	5.98	19.1	7.9	52.7	50	9.48	6.7	1.5
1899	14	24	3759	2072	3773	2096	5.55	21.1	8.3	50.2	50.1	9.98	6	2.1
1900	18	30	3082	2388	3100	2418	7.80	39.	17.7	67.4	79.6	11.81	7.9	2.4
July	..	..	77.5	76.5	..	..	9.86	1.71	.81	1.88	2.69	14.31	.39	.14
Aug.	..	..	54.0	52.4	54.0	52.4	9.70	2.35	1.28	1.22	1.53	12.50	.54	.18
Sept.	.1	.2	195.4	201.8	195.5	202.0	10.33	2.41	1.16	2.99	3.82	12.77	.66	.16

EXPORTS AND IMPORTS OF MANUFACTURED COTTONS.

Value in units of $100,000.

Year Ending June 30.	Exports — Value.					Imports — Value.							
	Colored.	Uncolored.	Apparel.	Other.	Total.	Colored.	Uncolored.	Apparel	Laces, etc.	Thread.	Knit Goods.	Other.	Total.
1890	29	55	2	14	100	33.7	1.3	3.4	114.5	9	71.5	65.8	299.2
1891	26	93	3	15	137	42.4	1.7	12	105.9	8.6	67.4	59.2	297.2
1892	25	87	4	16	132	45	1.4	12.6	112.5	6.6	58.3	46.7	283.1
1893	28	63	5	22	118	55.4	2.6	16.8	127.4	7.6	63.9	61.8	335.5
1894	38	76	5	24	143	33.8	1	16.6	80.2	3.3	43.6	45	223.5
1895	35	70	5	28	138	54.3	1.2	27.7	116.9	6.6	65.4	59.9	332
1896	34	95	7	32	168	49.2	1.8	26.8	108.8	8.7	61.9	67.1	324.3
1897	48	125	9	29	211	44	2.7	26.3	125.7	6.5	56	83	344.2
1898	41	92	9	25	167	53.1	1.2	10.5	117.7	6.9	40.3	42.9	272.6
1899	52	138	13	30	233	66.5	1.1	10.3	145.5	8.5	43.4	45.3	320.6
1900	48	132	16	37	233	81.6	3.6	12.4	192.1	21	47.2	55.3	413.2
July	4.58	10.28	1.06	2.66	18.58	3.55	.07	.91	14.42	2.32	4.17	6.59	32.05
Aug.	4.15	3.12	1.31	2.55	11.13	2.72	.07	1.52	13.70	1.77	4.65	6.17	32.60
Sept.	5.42	3.61	1.27	2.42	12.72	2.90	.12	1.57	14.88	1.32	4.28	4.75	29.82

—According to French textile journals, the scarcity of cotton has not yet proved a great hardship to French mills, as has been the case with English cotton mills. The French manufacturers, it seems, purchased heavily in anticipation of the scarcity, and now are able to keep their mills running, while the English mills are shut down.

—During the past decade according to the British counsul at Smyrna, the preponderance of Manchester in the cotton imports of Smyrna has been substantially shaken. In T cloth, American competition, which supplies more durable goods, has supplanted the English manufactures. In shirtings the Americans have also acquired the greater part of the market. America is likewise supplying prints, the people of the Levant regarding with high favor such goods from that country.

—The Roumanian government is considering the question of establishing a spinning mill to be owned by the government, and managed by the Secretary of Agriculture and Industry.

—Professor Frech, of Breslau, estimates that the greater part of the present coal fields of England, Germany and France, will be exhausted in 300 years, and predicts that in 1000 years the center of the world's industry will be located in China by reason of the extensive iron and coal fields there.

NEW ENGLAND COTTON MANUFACTURERS' ASSOCIATION.

Semi-Annual Meeting at Washington, D. C., Oct. 16, 18 and 18, 1900.

The 69th meeting of this association was held at the Arlington hotel, Washington, D. C., Oct. 16th, 17th, and 18th. About 130 members and guests left Boston Monday, Oct. 15th, by Fall River Line, and this number was increased by accessions at various points on the route.

Among all those in attendance, the Southern manufacturers formed a most welcome and suggestive feature of the meetings. Welcome because in both business and social relations there was a union of North and South. Meeting as they did at the national capital, all felt that there should be no rivalry between Northern and Southern mills that did not already exist between the different mills in the same section.

They met almost in the shadows of the capitol, where laws were made which affected all of them alike, and all seemed impressed with the fact that there were great interests in common which would unite the cotton industry of the United States.

The weather from the time the party left until they returned home, was all that could be desired. The meetings were so arranged as to give an opportunity to visit the many points of interest in Washington and vicinity. All availed themselves of the privilege, and still a good attendance was present at the meetings.

At the first session, on Tuesday evening, the Association after being called to order by secretary C. J. H. Woodbury, was welcomed to Washington by Secretary Gage of the Treasury Department, and by Secretary Long of the Navy Department.

The Hon. Carroll D. Wright, chief of the United States Bureau of Labor Statistics, spoke on "The Factory as an Element in Social Life." He traced the various changes in the mill employees of this country, and advanced interesting theories as to the progress made by factory operatives, their social condition and the causes for the successive appearance and disappearance of the New England, Irish, French-Canadian and Greek races as operatives in Northern mills.

Mr. Wright's remarks were listened to with close attention, and he gave his hearers a broad view of the social question as related to the operatives of our mills.

Letters of regret were read from Postmaster General Gary and Secretary of War Root, also a cablegram from Charles Lawton of the American Thread Co. It was announced that Buffalo had been selected as the place for the next fall meeting of the Association, during the Pan-American Exhibition.

President Thompson then delivered his address, in which he referred to the important issues at stake in the political contest then at its height, and which has since been settled by the election of President McKinley. He announced that the President of the United States would receive the members and guests at the White House at 11.30 a. m. on the following day, Wednesday. Nearly all were in attendance to meet President McKinley, who received the party, giving each one a cordial greeting.

After this reception the party grouped themselves on the War Department steps to be photographed. Owing to a spirited contest between rival photographers as to who should snap the group, it looked at one time as if no picture would be taken, but happily peace was declared in time, and we are able to give our readers a view of the group.

The second, or afternoon session, on Wednesday, was opened by the reading of a very interesting paper on "The Cotton Plant" by Walter H. Evans, Ph. D., United States Department of agriculture. It was freely illustrated by specimens of cotton plants in bloom, cut that day on the Potomac

N. E. COTTON MANUFACTURERS' MEETING. GROUP ON THE WAR DEPARTMENT STEPS.

flats, where the U. S. Government has an experiment station. Lyster H. Demey, of the U. S. Dept. of Agriculture, read a paper on American-grown Egyptian cotton, which was illustrated by specimens of cotton bolls and fibre grown in Egypt and the United States.

The next paper was read by Richard H. Edmonds, Baltimore, Md., on America's Textile Industry—A Southern View.

R. H. Miller, Jr., of Charlotte, N. C., followed with a paper, entitled "The Possibility of Cotton Manufacturing in the United States, and Especially in the South."

Wednesday evening the meeting was addressed by Secretary Wilson of the U. S. Dept. of Agriculture. He spoke of the great benefit arising from an intelligent development of the cotton plant, and was followed by Dr. Webber of the Agricultural Department who spoke on the cotton plant, and showed many photographs illustrating his remarks.

Chas. H. Fish of Dover, N. H., then read a paper entitled "The Use of Stationary 'Cells' in Place of Rotary Cylinders in the Dyeing of Textile Fabrics." The next paper on "The Putting up of Yarns for Use and for Market" was read by F. H. Bishop of the Universal Winding Co.

The secretary read the paper by George R. Smith, Osset, Eng., on "Yarn Testing and Testing Machines."

At this session, it was announced that thirty-five members had signified their intention of accepting the invitation of the Southern Railroad to take a trip over the road and through the great manufacturing district of the South.

Thursday afternoon, D. A. Tompkins of Charlotte, N. C., addressed the meeting on Markets for American Goods. He opened his address with a high tribute to President Thompson for his valuable services in the cotton industry, and for the wise foresight which enabled him to predict the future development of cotton manufacturing in the Southern States, when that section lay helpless and prostrated by the ravages of a recent war, and when such predictions were scoffed at as chimerical.

The speaker, referring to the political situation, indicated clearly his belief that no partisan spirit should have a place in the Association, that the interests of the cotton industry were large enough and broad enough to embrace both parties, and to give it the right to claim protection from all administrations. He urged the manufacturers to agree on what governmental action should be taken to introduce our cotton goods in the markets now supplied by nations who buy the raw cotton for their products from the United States.

A paper by Edward W. Thomas on "The Uses of Cotton Waste," was submitted together with samples of roving, yarn and cloth manufactured abroad from cotton waste.

The next paper on "Our Cotton Export Trade with China," was read by Daniel Moore Bates, Jr., Wilmington, Del., who was followed by Richard H. Hill, M. E., Boston, with an interesting and practical paper on "Friction Clutches."

H. G. McKerrow, of Boston, read a paper on the latest development in Cotton Combing.

At the fifth and last session, 23 candidates were elected to active membership, and 15 to associate membership in the Association.

Rear-Admiral Geo. W. Melville, chief engineer of the United States Navy, made a brief address which was heartily applauded. A paper prepared by Paul Schulze, of the Royal Textile Museum, Crefeld, Germany, was presented, and the convention adjourned. Most of those in attendance left Washington on Friday morning, well satisfied with their trip. The transportation was in charge of Raymond & Whitcomb, who carried out the programme in their usual satisfactory manner.

The following is a list of those present:

Members:—Joseph D. Aikin, Taftville, Conn.; Daniel Moore Bates, Wilmington, Del.; Robert Beatty, Philadelphia, Pa.; T. Ashby Blythe, Philadelphia, Pa.; Frank A. Bowen, Lowell, Mass.; Henry R. Brown, Phenix, R. I.; William D. Cadwell, Nashua, N. H.; Charles H. Collins, Ashton, R. I.; Frank H. Cotton, Hope Mills, N. C.; H. H. Culver, Taunton, Mass.; Charles W. Dennett, North Adams, Mass.; Edward P. Dennis, Lowell, Mass.; George E. Farrell, Utica, N. Y.; Charles H. Fish, Dover, N. H.; Frederick A. Flather, Lowell, Mass.; F. C. Fletcher, Providence, R. I.; M. F. Foster, Milford, N. H.; John W. Fries, Winston-Salem, N. C.; Edward T. Garsed, Greensboro, N. C.; Charles H. Gorton, Columbus, Ga.; George P. Grant, Jr., Fitchburg, Mass.; D. W. Gray, Utica, N. Y.; R. A. Gray, Allenton, R. I.; S. Greenwood, Cornwall, Ontario; John Gregson, Fiskdale, Mass.; Z. D. Hall, Adams, Mass.; John F. Hamlet, Fall River, Mass.; William B. Hawes, Fall River, Mass.; Alfred Hawkesworth, Montreal, P. Q.; Fred Hawkesworth, Montreal, P. Q.; James G. Hill, Lowell, Mass.; Charles H. Hobbs, Thorndike, Mass.; George W. Holt, Putnam, Conn.; Stephen A. Knight, Providence, R. I.; Webster Knight, Providence, R. I.; Walter H. Langshaw, New Bedford, Mass.; Evan Arthur Leigh, Boston, Mass.; Arthur H. Lowe, Fitchburg, Mass.; Thomas Mayor, Providence, R. I.; John Tempest Meats, Taunton, Mass.; Henry P. Meikleham, Bath, S. C.; J. R. Montgomery, Windsor Locks, Conn.; William G. Nichols, Chester, S. C.; Haven C. Perham, Lowell, Mass.; J. E. Prest, Cohoes, N. Y.; T. H. Rennie, Graniteville, S. C.; Edward H. Sanborn, Philadelphia, Pa.; Arnold Schaer, Warren, R. I.; Charles M. Sears, Langdale, Ala.; Thomas C. Sheldon, Fitchburg, Mass.; William F. Sherman, Boston, Mass.; Thomas H. Smith, Jamestown, N. Y.; J. C. Smith, Fall River, Mass.; Thomas Henry Smith, Jamestown, N. Y.; S. S. Spencer, Lancaster, Pa.; George E. Spofford, Blackstone, Mass.; Henry B. Sprague, Lynn, Mass.; Leroy Springs, Lancaster, S. C.; D. G. Sunderland, Pelham, S. C.; Edward W. Thomas, Lowell, Mass.; D. M. Thompson, Providence, R. I.; D. A. Tompkins, Charlotte, N. C.; George W. Towne, Lawrence, Mass.; Oscar B. Truesdell, Newtonville, Mass.; George W. Turner, Gloucester, N. J.; Herbert E. Walmsley, New Bedford, Mass.; Joseph Watters, Fall River, Mass.; Joseph W. Wattles, Canton Junction, Mass.; Charles D. White, Norwich, Conn.; Z. L. White, Winchendon, Mass.; Alfred N. Whiting, Oakdale, Mass.; George F. Whitten, Manchester, N. H.; W. R. B. Whittier, Chattahoochee, Ga.; John B. Wild, Utica, N. Y.; Broadus E. Willingham, Macon, Ga.; C. J. H. Woodbury, Lynn, Mass.; S. B. Alexander, Jr., Charlotte, N. C.; Eugene C. Andres, Boston, Mass.; George R. Babbitt, Providence, R. I.; Edwin Barnes, Boston, Mass.; F. H. Bishop, Boston, Mass.; Henry G. Brinckerhoff, Boston, Mass.; John H. Burghardt, Boston, Mass.; James Butterworth, Philadelphia, Pa.; Thomas G. Cox, Taunton, Mass.; W. L. Draper, Augusta, Ga.; C. E. W. Dow, Atlanta, Ga.; T. C. Entwistle, Lowell, Mass.; Royal W. Gates, Lowell, Mass.; Sumner S. Gould, Lowell, Mass.; Arthur F. Gray, Boston, Mass.; Richard H. Hill, Boston, Mass.; Alfred K. Hobbs, Manchester, N. H.; John E. Kendrick, Providence, R. I.; Frank B. Kenney, Lowell, Mass.; Stephen C. Lowe, New Bedford, Mass.; D. E. McGaw, Atlanta, Ga.; H. G. McKerrow, Boston, Mass.; John R. Mitchell, Malden, Mass.; William R. Noone, Boston, Mass.; Sidney B. Paine, Boston, Mass.; Arthur Parkinson, New York, N. Y.; E. R. Richardson, Pawtucket, R. I.; H. E. Stafford, Providence, R. I.; James Strang, Indian Orchard, Mass.; John Sykes, Huddersfield, England; James T. Thornton, Providence, R. I.; Rienzi W. Thurston, Fall River, Mass.; George E. Tillinghast, Providence, R. I.; Allison W. Trafford, Fall River, Mass.; Justin A. Ware, Worcester, Mass.; W. W. White, Worcester, Mass.; Fred A. Wilde, Pawtucket, R. I.

Guests:—George E. Alexander, Providence, R. I.; J. B. Allen, Atlanta, Ga.; Benjamin Anthony, New Bedford, Mass.; S. B. Ashley, Fall River, Mass.; George B. Blacker, Philadelphia, Pa.; E. E. Blake, Newton Highlands, Mass.; W. W. Ballagh, New York, N. Y.; J. J. Bradley, Marion, S. C.; J. H. Bragdon, New York, N. Y.; George H. Burgess, Boston, Mass.; Frank H. Burt, Boston, Mass.; Col. D. Cardwell, Columbia, S. C.; L. A. Carpenter, Maiden, N. C.; Frank H. Carron, Hope Mills, N. C.; Eugene B. Clark, Washington, D. C.; J. D. Clouder, Atlanta, Ga.; M. H. Coffin, Whitinsville, Mass.; James A. Cooper, Whitinsville, Mass.; S. S. Dale, Boston, Mass.; Charles Warren Davis, Augusta, Ga.; Dr. Lyster H. Dewey, Washington, D. C.; J. P. Eddy, Providence, R. I.; R. H. Edmonds, Baltimore, Md.; Dr. Walter H. Evans, Washington, D. C.; Hon. Lyman Gage, Washington, D. C.; P. Gillan, Fall River, Mass.; J. E. Hays, Boston, Mass.; A. O. Hewitt, Boston, Mass.; George F. Heywood, Providence, R. I.; John Hill, Atlanta, Ga.; George B. Hiss, Charlotte, N. C.; Frank H. Hitchcock, Washington, D. C.; W. C. Houston, Jr., Philadelphia, Pa.; Carroll Hutchins, Boston, Mass.; Richard Johnson, Oldham, England; T. C. Johnston, Philadelphia, Pa.; A. W. Jones, Atlanta, Ga.; Joseph C. King, Boston, Mass.; Henry G. Kittredge, Boston, Mass.; William M. Kendrick, Augusta, Ga.; H. B. Lincoln, Worcester, Mass.; J. H. Mays, Charlotte, N. C.; E. L. McKerrow, Providence, R. I.; P. J. Meaney, New York, N. Y.; Rear Admiral George W. Melville, Washington, D. C.; H. Monroe, Boston, Mass.; F. I. Nichols, Fitchburg, Mass.; S. S. Nostrand, New York, N. Y.; W. F. Nostrand, New York, N. Y.; William A. Orton, Washington, D. C.; R. H. Pettus, Charlotte, N. C.; J. Harper Poor, New York, N. Y.; Dr. Henry S. Pritchett, Boston, Mass.; C. H. Purse, Charlotte, N. C.; M. V. Richards, Washington, D. C.; S. I. Roberts, Danville, Va.; Charles H. Sammons, Charlotte, N. C.; W. F. Savage, New York, N. Y.; J. J. Shiers, Handfort, England; Charles H. Sites, New York, N. Y.; James W. Switzer, Washington, D. C.; B. S. Terry, Providence, R. I.; W. W. Toll, Boston, Mass.; George W. Tyner; Frank M. Walters, Fall River, Mass.; George T. Wattles, Canton Junction, Mass.; Dr. H. J. Webber, Washington, D. C.; William Welch, Hopedale, Mass.; James N. Williamson, Durham, N. C.; Hon. James Wilson, Washington, D. C.; Philip Worth, Providence, R. I.; Hon. Carroll D. Wright, Washington, D. C.; Mrs. Benjamin Anthony, New Bedford, Mass.; Mrs. Robert Beatty, Philadelphia, Pa.; Mrs. J. E. Prest, New York, N. Y.; Miss Jessie Prest, New York, N. Y.; Mrs. Henry G. Brinckerhoff, Boston, Mass.; Mrs. Frank A. Bowen, Lowell, Mass.; Mrs. E. E. Blake, Newton Highlands,

Mass.; Mrs. M. F. Briggs, Chicago, Ill.; Miss B. S. Brown, Lynn, Mass.; Miss E. W. Butterworth, Philadelphia, Pa.; Mrs. Charles H. Collins, Ashton, R. I.; Mrs. James A. Cooper, Whitinsville, Mass.; Mrs. H. H. Culver, Taunton, Mass.; Mrs. George Ross Eshleman, Lancaster, Pa.; Mrs. George W. Holt, Putnam, Conn.; Mrs. William M. Kendrick, Augusta, Ga.; Mrs. Frank B. Kenney, Lowell, Mass.; Miss Josephine L. Mason; Mrs. John T. Meats, Taunton, Mass.; Mrs. Haven C. Perham, Lowell, Mass.; Mrs. T. H. Rennie, Graniteville, S. C.; Mrs. J. C. Smith, Fall River, Mass.; Mrs. S. S. Spencer, Lancaster, Pa.; Mrs. H. B. Sprague, Lynn, Mass.; Mrs. Rienzi W. Thurston, Fall River, Mass.; Mrs. A. W. Towne, Lawrence, Mass.; Mrs. Allison W. Trafford, Fall River, Mass.; Mrs. Herbert E. Walmsley, New Bedford, Mass.; Mrs. William Welch, Hopedale, Mass.; Mrs. W. W. White, Worcester, Mass.; Mrs. W. R. B. Whittier, Chattahoochee, Ga.; Mrs. Fred A. Wilde, Pawtucket, R. I.; Mrs. James N. Williamson, Durham, N. C.; Mrs. Broadus E. Willingham, Macon, Ga.; Mrs. C. J. H. Woodbury, Lynn, Mass.; Miss Alice P. Woodbury, Lynn, Mass.

About thirty-five of those who attended the Washington meeting accepted the invitation of the Southern Railway Company's agent to take a trip over their line. Stops were made at Danville, Va., Reidsville, N. C., Greensboro, N. C., High Point, N. C., Salisbury, N. C., and at Charlotte, N. C., where the visitors were entertained by the Merchant's Club. Other stops were made at Lowell, N. C., Gastonia, Bessemer City, King's Mountain, N. C., and Gaffney, S. C., where they were entertained by the Gaffney Manufacturing Company.

A stop was made at Asheville, the party visiting Biltmore, and at Spartanburg the colored churches were visited Sunday evening. At Atlanta, the American Cotton Company took the party to the International State Fair, where the round baling machine was in operation.

Upon starting for home, the guests presented a loving cup to Mr. Richards, of the Southern Railway Company, as a mark of their appreciation of the hospitalities extended to them. The entire trip was very enjoyable, giving the Northerners a good opportunity to see the mills of the South, whose competition in recent years they have felt so keenly, and to know from experience what Southern hospitality really is.

LABOR QUESTION IN THE SOUTH.

CUYLER SMITH.

For the Textile World.

With the coming of the cotton mills to the cotton fields, a great change has been worked in the lives of the Southern poor whites resident in the Piedmont Section of the Carolinas, Georgia, Tennessee and Alabama.

Since the close of the Civil War these people, numerically several millions, have dragged out a miserable existence on isolated farms nestled in the valleys and coves of the Blue Ridge and its foothills, or as "croppers" on the plantations of the landed gentry, who, immediately after the war, rented out their ancestral acres and moved with their families into the growing cities, there to engage in business. From this class of gentlemen have sprung the men who organized the cotton mills which now attract the white labor from the country. In antebellum days the owners of plantations were educated men of affairs, so the change from managing a vast agricultural establishment to directing a bank, a mill, a factory or great commercial house was not so difficult to those who were so peculiarly fitted to command men.

Many of the negroes followed their late masters to town for two reasons; it was the paradise to which their race had looked from the fields and quarters of the old plantation as a place where a negro could live without working, and find congenial companions; the other great reason for exodus of the black men to town was the desire to remain the servants of the cultured white man, and escape the domination and often violence of the "poor white trash," as the slaves had dubbed them far back in the other century.

With no owner, no protector, and the bewildering effects of sudden emancipation, coupled with the disturbing doctrines, taught the freedman by those harpies of reconstruction days, the skalawag and carpet-bagger, the

country negro was in no enviable position if he remained on the farms with the white cropper.

In olden days the gentlemen protected the negro and restrained the violent hatred of the poor white toward all negroes. These "poor white trash" were not tramps or nomads, yet they showed some of the characteristics which stamp the gypsy. They lived in small cabins on stray bits of unproductive soil, raised a large family of tow-headed children who never saw a school or scarcely ever heard a kind word. This class hunted and fished and carried on a contraband trade with slaves, giving whiskey in exchange for the plunder petty thieves brought by night to their hidden stills. Later, they were the first illicit distillers.

The natural supposition would be that this class of people would sympathize with the slaves in any desire for freedom which they might have, or affiliate politically with the abolitionists; but such was not the case, except in Eastern Tennessee and other certain remote mountainous regions of Kentucky, North Carolina and West Virginia, where there were but few slaves. There the poor whites were of a different nature, and to a large extent most unfriendly to the slaves and slave-holders, but this was not true elsewhere. On the contrary the most ultro pro-slavery people in the South were, without doubt, the poor whites. These men had votes and it was their solid support of Robert Toombs and his like that took states out of the Union, and overcame the wise councils of such men as Alex. Stephens and Ben. Hill, who were opposed to secession and its inevitable results; war and devastation.

The slave-owner would calmly discuss emancipation, pro and con, speaking his mind freely (and it is interesting to note that not a few were favoring gradual emancipation in the early fifties), but to the poor white, who never owned a slave and could never expect to own one, it was dangerous to even mention the subject save in commendation of the system of slavery.

The color, freedom and vote of the poor white were his only superiority over the slave. Therefore, as freedom to the slave meant immediate degradation to the poor white, his bitterest feelings were instantly aroused by the mere suggestion of freedom for the slaves, and it was this intense feeling that made them the fiercest soldiers in the Confederacy.

After the war they formed the "Ku-Klux-Klans," and ever since have been opposed to negro advancement, and vote to a man with the Democratic party. So much for the past of this class, from which is drawn the operatives employed in Southern cotton mills. It will be observed that from the earliest days they have considered themselves the social equals of the educated Southerner. In my visits to scores of Southern factory towns, I find this to be still the case. They have always sought the advice of their old men and their friends before taking any decisive steps in their business relations. Early environment, poverty and the war have conspired to make the parents of the Southern operatives of today, conservative to narrowness, suspicious of strangers and their suggestions and offers, and most difficult to lure into any kind of an agreement which has the slightest savor of curtailing their freedom or merging their individuality into that of any one else.

These people deal with life as units, relying solely on themselves to settle the daily problems. According to their ideals, that is manhood. They must be dealt with as units, not masses. In all this country I have never found a people so entirely independent in thought, manners and feelings. No two ever took the same view of any question. But on the "negro question" they are, strangely, unanimous.

The operatives of the new cotton factories are the children and grandchildren of the men who fought in the civil war, now gray veterans who spend the evening of their lives in the

cottage chimney corners, oracles and Nestors for all the young folks gone up to town to handle the spinning-frame and loom.

No sooner is a mill company organized by the progressive capitalists of the village than the old soldier, hearing the good news bawled over the fence by a passing neighbor, back from a day's trading in town, calls up his family and announces his intention of journeying "ter town termorrer, an' I reckon the colonel will give yer er chanst ter hep him run his factory."

The old man does go to the Colonel, the same man who led him and his friends on the great battle fields of that regrettable struggle. He takes his wealthy friend aside and bespeaks his "takin' them chillun, ever one uv 'em, in yer new mill. Me an' my ole woman needs the support, Colonel, an' the chillun will sho' work yer way, sah, if yer'll only give um er chanst."

The mill is built, and the old man brings the hands to live in the clean, brightly painted cottage on the hill to begin a new life where all the family may work and earn more clear money in one month than they have made in twelve months on the cotton farm.

The old man goes home to his cabin, but the young people are never away from his conservative influence, for Saturday night sees them going out for Sunday at the old home. Then all questions, especially the one now coming to the front, "Shall we join a labor union?" are discussed. These old men advise against the joining of a union. Monday the operatives are at the mill, and turn a deaf ear to the organizer who was eagerly listened to last week. It is a combination of all these peculiar conditions that makes the growth of labor unions among Southern cotton-mill workers slow growth.

The men who own the mills are of all classes, local bankers, merchants and farmers, large and small. The average stock held by each is less than $500. This brings the mill owners and the masses close together. An operative is usually a cousin of some stock-holder. One Georgian, who has made a large fortune by manufacturing, said, looking at his operatives passing out from the mill, "I enjoy feeding and clothing these people more than all the money I have made." Another said to me, "I am taking all my operatives picnicing Saturday and footing the bills myself." This man gives his young help half an hour off twice a day to play in the grove surrounding that mill.

Many mills, like those at Pelzer and Piedmont, S. C., provide free schools and enforce attendance. These are the two largest Southern mills. House rent is usually gratis, or at the rate of 50 cents per room a month. Fuel is at a nominal cost, and not necessary, save for cooking, exceeding 90 days a year.

It is claimed in the East that Southern mills pay starvation wages. This is an error. Our mills pay by the piece, and good weavers, for instance, earn $1.00 to $2.50 a day on average Southern goods. As I reckon it, there cannot be over 10 per cent. difference, the Eastern wage being the higher. But it is true that the Southern hours are longer. However, the reduced cost of living South, low rentals, cheap fuel and other advantages make the operatives' wages really higher than in the East.

Thus the operatives have so vastly improved their condition by working in the mill, not on the farm, that they are little inclined to ask for shorter hours or increased wages. They are the most uniformly contented and prosperous class in the South.

I know of three factories in Georgia which are examples, proving my deductions are correct. At High Shoals the factory has been in operation forty years. The labor is drawn from the vicinity. No strike has ever occurred; not even a misunderstanding arisen. There are 500 people in the village, happy, contented and prosperous. I asked one at her loom, "What would you do if the factory shuts down?" "Who, me? Why, I'd pick cotton out at gran-pap's until hit

started up again."

These people are capable of self-support at all times and actually resent the idea that they could not earn a living. Judging by what I have seen of Southern farm life, I feel certain these mill people regard the new village as a sort of paradise. Here the 50 odd negroes are servants in the operatives' households or draymen at the mill.

The negroes are going to return to farming when the whites come to the mill. A negro can't work in a mill. The hum of the machinery would put him to sleep, and if he even got a dollar ahead he would loaf a week. Ex-Governor McDaniel is at the head at High Shoals and his influence is very great with the mill people. They utterly refuse to join unions.

Trion Factory was established in 1845 by the Allgood family. It is located in northern Georgia, and was the pioneer factory in that section. The large mill village is filled with a happy and prosperous people, drawn from the little valleys of that rugged region. The President is on friendly terms with his operatives, and states that no strike, friction of any kind, or demand for change of hours or pay ever occurred at this large mill. No union has been formed there. The 3000 in this village are most comfortably housed, and behind each cottage is a garden which supplies the family with vegetables.

At the Whittier Mills, eight miles from Atlanta by trolley, the 600 inhabitants of that model mill village are the country people of the immediate vicinity. It was here that an attempt was made to take them into a union, but they refused, being advised against it by their elders back in the country. I consider this little community one of the most orderly, progressive and universally prosperous in the South.

The company maintains an excellent school on the grounds, which is well attended. Mr. Whittier is an Eastern man and knows Southern character, and governs his people accordingly. They are his friends and he has proven himself theirs.

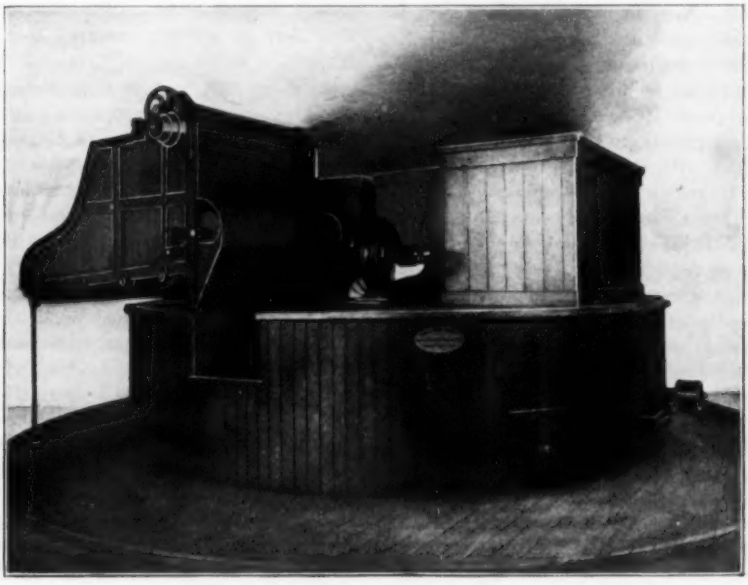
Recently professional agitators have been at work in Atlanta and other mill towns. Their work has been unsuccessful. The most determined opposition was by the operatives. In several instances mill owners interfered when the agitator, as was the case in Atlanta, denounced them as "robbers and thieves who would put the non-union operative into slavery." This speaker represented himself to be an English minister, but he scarcely referred to the gospel.

Southern mill owners have charged that these agitators are in the pay of Eastern mill men. There is no proof, but as our people have nothing to fear from labor unions and our Eastern spinners have, this is an open question for every man to decide. Misleading advertisements appearing in our papers stating that "Southern mill operatives are wanted in Eastern mills," and "$8.00 to $10.00 is paid," but for what? The ads do not say. My mill friends tell me they believe these are printed solely to agitate their operatives into demanding increased wages. Personally I don't believe that the agitators are emissaries, as charged, or the advertisements printed for any bad purposes. Though it is queer that the latter appear at the time when many Eastern mills are shut down. I know spinners all over the East. They are not men likely to resort to such tricks. Our country, our trade and our opportunities are too large, extensive and unlimited for one section to be that jealous of another. Recent international events are drawing the East and South together, and their interests are too closely allied for such charges to be true.

Careful consideration of existing conditions in the Southern mills shows that no change in hours or wages may be expected in many years. The operatives assure me, in conversation, that they have all that can be desired. As to the supply of

help, it is ample to meet the demands of manufacturers for all time to come. Usually there are five to ten applications for every possible place in a new mill.

The Southern operative is a pure-bred American, of good old Colonial stock, and thoroughly satisfied with his employment. He has recently bettered his condition a thousand fold, without the aid of a union, and he will scarcely join one while present conditions exist, and I judge that they will continue unchanged for a quarter of a century, at least.



THE STONE DRYER FOR RAW STOCK.

The Stone Dryer for Raw Stock.

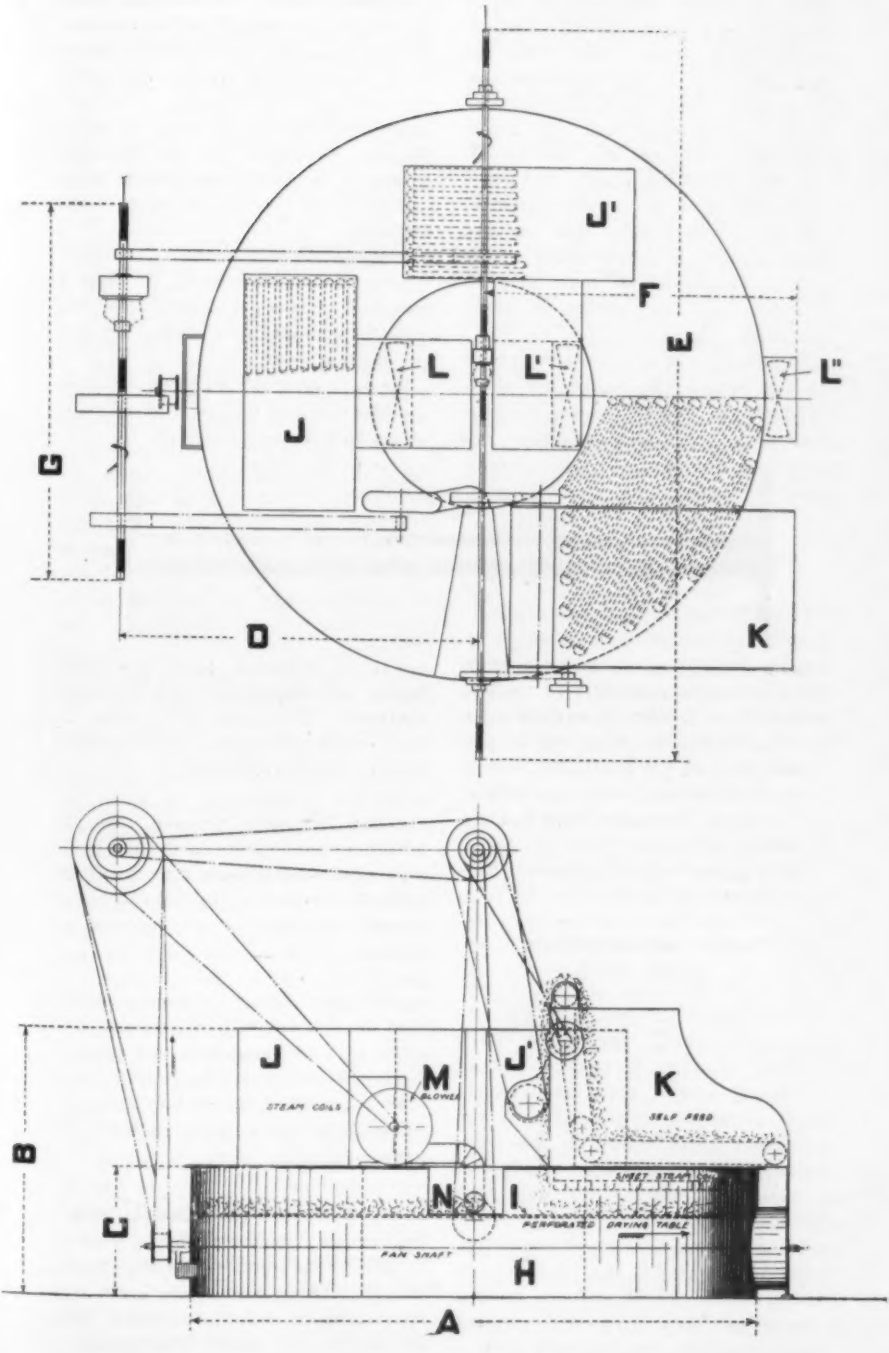
Something new in textile machinery is found in the Stone dryer for raw stock, shown in the illustration.

In building this machine, the aim has been to combine the acknowledged advantages of the flat, stationary dryer, and economy of the automatic machine.

Automatic machines are essential for handling the large quantities of raw stock used by modern mills. The builders claim that this machine will dry stock as cheaply as can be done by any other method, while the mechanism is so simple that the objections to automatic raw stock dryers are removed.

The dryer consists of a revolving, circular, flat, perforated, iron drying table (I), Fig. 2. A self feed (K) delivers the stock to this table in an open fluffy condition. The stock is first subjected to a current of air from the fan (L″), the moist air escaping through an opening at side of cylinder (H). Successive currents of air from L′ and L complete the drying process, and the revolving table brings the stock in front of a blower pipe (N), where a blast of air ejects the stock from the machine. The dry stock can be thrown on the floor, or by connecting the exit with a pneumatic conveyer, can be carried from the dryer to any part of the mill. Wool can be carbonized by reducing speed of machine and increasing temperature of the air.

It is claimed that repairs are reduced to a minimum by the absence of all endless woven wire aprons, or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PERFORATED DRYING TABLE
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FAN SHAFT
H
A

other mechanism liable to get out of order. The machine is self cleaning, as the stock passes easily from the iron table, thus saving time consumed in cleaning when changing from one color or grade to another. The steam coils are so situated that no dust or lint can collect on them. The wool comes out in an open, lofty condition, and the builders state that the machine requires less floor space in proportion to production than that required by any other system of drying raw stock.

This dryer is in use in several of our leading mills. The reputation of its builders, the James Hunter Machine Company, North Adams, Mass., as makers of textile machinery, is a guarantee as to the durability of its construction. It is made in various sizes, varying in capacity from 1000 to 1500 pounds of stock per ten hours.

All of the wearing parts are of iron, and all parts in contact with hot air, are either tin or iron.

The builders will be pleased to furnish further information.

Dresser and Jack Spools.

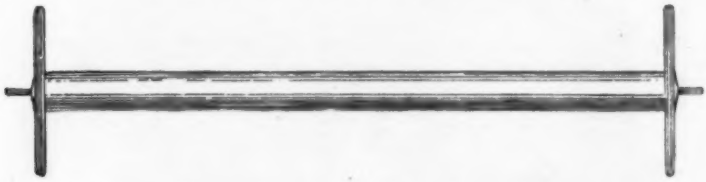
Too little attention is paid to bobbins and spools in our mills. The loss from using poorly constructed spools consists not alone in the first cost of the spool, which is a comparatively small item, but besides this is the very heavy loss caused by the extra waste made where spools are broken or get out of order when filled with roping or yarn.

There is also the loss of production from spools giving out, or, what is worse, being out of order a greater part of the time, keeping the operatives continually tinkering on them.

The spools should be as large as conditions admit. They should also be built in a thorough and substantial manner with the heads fastened firmly so as to form practically one piece with the barrel. Such a spool pays large dividends to the mill. Chas. O. Murray, Nashua, N. H., manufacturer of spools, bobbins and shuttles, aims to furnish such goods as we have described.

The heads are fastened to his spool, shown in the illustration, in such a way that he is ready to guarantee that with the ordinary mill usage, they will not become loose.

He is connected with no trust or combination and will be glad to quote prices to any one interested.



—It is reported that mercerized linens have appeared in the European markets. They have been made in solid colors and plaids, and it is stated they are very attractive.

—The Egyptians favored linen in textile manufacturing, and were probably proficient in this branch of the art long before the Hebrews acquired an understanding of the methods of working wool.

—Oil spots of long standing should first be treated with chloroform, and then with the magnesia and benzine paste. Spots caused by tallow, lard, wax or paraffine should receive an application of castor oil to dissolve the grease.

—It is believed that the first fulling mill in the American colonies was installed in the village of Rowley, Mass., in 1643. Other mills were erected at Watertown in 1662; at Andover in 1673; at Ipswich and Salem in 1675; and at Barnstable and Byfield in 1687.

Worcester Slasher Compressing Roll.

The process of spooling and dressing both cotton and woolen warp has much effect upon the subsequent process of weaving. If yarn is wound soft on the beam, the strain to which it is subjected in the loom draws the warp down into the beam, making depressions which bring extra strain on some of the threads, causing breakage while weaving, and streaks in the finished goods.

The harder a warp is beamed, the better it weaves. Note the pleasure on a weaver's face, when she gets a solidly beamed warp. But the tight winding of yarn on the beam by old methods, means that great strain is put on the warp. This stretches the yarn, and if it is tender, results in breakage during beaming, and the weaver has to contend with a warp where the ends are appearing and disappearing in a most aggravating manner. The results are reduced production and imperfect goods. Again, yarn stretched in beaming loses much of its strength and elasticity, and breaks more easily in weaving.

With the ordinary friction appliances on warpers and slashers, it is in many cases impossible to put strain enough on the warp to secure a solid beam.

With the Worcester Warp Compressor, the yarn, instead of being pulled tight, as in the old process, is pressed down hard on the beam by a compressing roll. This method subjects the thread to very little strain. To one acquainted only with the old methods of beaming, it is a great surprise how slack the yarn is between the reel and the beam, and how hard it is wound on the beam. It is claimed that from 25 to 60% more yarn can be wound on a beam by this compressor, than by the old methods. This gain results in a saving of cost for drawing-in warps, and there are less warps to be put in the looms, thus increasing production.

The compressing roll for slashers has a ½" expansion end, and a 6" extension end, having rings of various widths that go on a sleeve which fits into the end of the roll. Taking off, or adding rings gives the various lengths for different widths of warps. Rolls can be made any desired length of body, with or without extensions, using the expansion on one end. The standard roll is 3½" in diameter, steel barrel, surface milled; cast iron ends, thick enough to resist wear, and cannot burr up and cut the warp. This compressor has for many years thoroughly demonstrated its merit in beaming woolen and worsted warp, and has also met with gratifying success when used on cotton warps. An illustration of the compression roll appears on Page 765 of this issue. It is built by the Worcester Warp Compressing Co., 91 Exchange St., Worcester, Mass.

The Pancoast Ventilator.

It no longer requires any great effort to convince manufacturers of the advantage of having their mills well ventilated. It is generally recognized now that good ventilation gives satisfactory returns, by reason of the greater efficiency of the operatives, in addition to the more healthful conditions which it assures.

The air may be renewed by mechanical means, or the natural circulation may be utilized. If the latter system is adopted, the ventilator should be proof against ingress of air, rain or snow. It should have a free exit in which no obstacle is placed to prevent the free movement of the air.

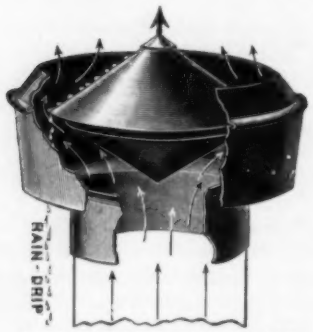
In addition to these points, it should be constructed so that the wind coming from any direction would have a tendency to create an upward or outward draft. The illustration of the Pancoast ventilator shows how these various requirements in a ventilator are provided for. This ventilator has been submitted to the test of actual usage for so long a time that its merits are generally admitted.

It is constructed of a high grade of iron, well braced, and it is conse-

quently calculated to withstand the usage to which outside ventilators are exposed. Besides being constructed on correct principles, it is an ornament to the building. It is in use in many of the best industrial establishments throughout the country.

The engineer of the Spreckles Sugar Refinery Company says: "The ventilators put over our filters last spring have proved very satisfactory, being always steam proof, and have free delivery."

Theodore C. Search says: "I regard the Pancoast ventilator a very excel-



THE PANCOAST VENTILATOR.

lent one indeed, and do not think any other is as good."

Globe Knitting Mills, Norristown, Penn.: "We consider our ventilating system perfect by the use of eleven Pancoast ventilators on our factory and dyehouse."

A ventilator which allows the air to go out, and prevents it from being blown in, is a very valuable feature on dyehouses in which steam from the dye-tubs is so objectionable in cold weather. In addition to ventilating, it is claimed that the Pancoast ventilator will prevent chimneys from smoking, as a down draft is impossible.

The National Pancoast Ventilator Company, 723 Drexel Building, Philadelphia, have recently issued a catalogue giving full particulars in regard to their various styles of ventilators, and parties in need of such apparatus would do well to secure a copy and correspond with them on the subject.

Final Decision in the Indoin Blue Patent Case.

The United States Circuit Court of Appeals handed down on October 16th a decree confirming Judge Cox's previous decision in the case of the Badische Anilin and Soda Fabrick vs. Kalle & Co., which declares valid the patent owned by the Badische for the dyestuff known as Indoin Blue. In the latest decision, the case was rehearsed at length, and the main features are sustained, and an injunction is issued against the defendants and any others for infringing their patents. This case has been in litigation for some years, and this decision finally settles one of the most important litigations in the history of the dye industry, not only because it sustains this particular patent, which is in itself very valuable, but also because it announces principles which are of great importance in favor of the validity of the Badische patents in general. The complainants, through their United States representatives, Messrs. Kuttroff, Pickhardt & Co., have conducted the case with much vigor, and many expert witnesses have testified on both sides of the case.

Gambling in Wool Futures.

There exists in France and Belgium a system of buying tops (or combed wool) on what is known as term contracts. For these sales prices are quoted daily in Roubaix and Antwerp for about twelve months ahead, so that anyone on making a contract for yarns, can cover himself for any month desired during the coming year.

The tops are sold in lots of 5,000 kilos, known as Filieres. For each Filiere bought, the purchaser has to deposit 1,000 francs, or £40, so that if he buys tops at five francs, he speculates on 25,000 francs worth of tops for a deposit of 1,000 francs, or in other words, he speculates on £1,000 worth for a deposit of £40. The only other obligation he undertakes is that if the market falls, he has to deposit

the amount of the fall in addition to the 1,000 francs, but if the market rises he can sell out at any time and pocket his profit.

You will thus see that an article of commerce has become the sport of speculators, in the worst form of Stock Exchange gambling, and it is said on good authority that in 1899, 40 million kilos were sold, and only four millions delivered, or 10 per cent. of the total sales. Thus the amount bought for pure gambling purposes was nine times as much as that bought for legitimate purposes.

This system enables unscrupulous and powerful speculators to disorganize a market under such circumstances. The difficulty has reached such a pitch that manufacturers and merchants in France have petitioned the National Assembly for the suppression of the system, and it is expected that some modification will take place.

In Germany the same system existed at Leipsic, but it has now been suppressed by the Government. The spinners there, however, took the initiative by boycotting all tops which they knew to have been bought under the term contracts.

Notes of the Month.

—The consolidation of the Southern Cotton Spinners' Association and that of the Hosiery Yarn Spinners' brings under one organization between 80 and 85 per cent. of the Southern spinners. The new association represents an annual business of over $40,000,000.

—Charles Fletcher has severed all official connection with the American Woolen Co., and, it is reported, has disposed of his stock in the concern. This marks another step in the gradual withdrawal from the company of practical woolen manufacturers who were in the combination when it was first formed. It is alleged that the Ray holdings of stock have also been largely liquidated. Samuel P. Colt, president of the Industrial Trust Co., of Providence, has been elected to fill the vacancy in the Board of Directors, caused by the withdrawal of Mr. Fletcher.

—The Argicultural Department has carried on experiments this summer on the Potomac flats, in raising hemp. It is expected that the results will show the Southern farmers that a grade of hemp equal if not superior to that grown in the Philippines can be raised in this country.

—The German government has engaged a number of students from the Tuskegee College to go to German Africa and start the cultivation of the cotton of which Germany at present obtains the supply in the United States.

—A circular letter has been addressed to officers and members of local unions, from the office of General Secretary-Treasurer Prince Greene, calling attention to conditions under which the General Council can endorse local strikes, and to the proposed limitation of the employment of women and children to ten hours out of the twenty-four, and the prohibition of child labor in factories.

The circular advises local unions to strengthen the condition of their treasuries, in order to prepare for the movement to establish a work day of not over ten hours, at not less than the present rate of wages. Attention is called to the alleged violation of the ten hour law in various states.

—The Hawaiian Islands became a part of the United States on June 4th, 1900, and there has been considerable confusion among exporters as to the price to be charged to their Hawaiian customers. When a foreign country, Hawaii was able to purchase goods at lower prices than were merchants in the United States, and since its admission to the Union some exporters still persist in treating it as a foreign country, and selling their goods at the reduced rates.

—There has been some agitation among South Carolina cotton manufacturers to enter into an agreement not to employ children under twelve years of age in their mills. It seems that the parents of the children are far more anxious to have them work in the mills than are the mill owners to employ them, and the opposition to a law fixing the age limit at which children shall be allowed to work in Southern mills arises almost entirely from the desire of the parents to get their children employed at an early age.

—Several broad minded manufacturing firms throughout the country, have, during late years, adopted various expedients for obtaining suggestions from their employees, in regard to the improvement of methods and machinery in the mills. This plan could be adopted to good advantage by textile mills. The latest scheme of this kind which has come to our attention, consisted in placing a box in a convenient place in the mill, to receive the suggestions, and posting a notice that $100 would be divided into four prizes for the four best suggestions made.

Foreign Notes.

—The exports of wool from Montevideo from November 15, 1899, to June 20, 1900, were 37,912 bales, in comparison with 64,619 bales for the same period in 1898-99. For the time named, ending June 20 last, the number of bales sent abroad were to the following markets: Dunkirk, 12,276, Antwerp, 11,333; Hamburg, 5,603; Liverpool, 5,322; Bremen, 1,744; Genoa, 983; New York, 436, and Havre, 215.

—Wages for wool combers at Roubaix, France, are low, varying from 44 to 77 cents per day of 11 hours. Boys work at night and women and children take their places during the day. It is the least remunerative of the different branches of textile work. The daily wages for cotton and wool spinners is 96 cents, and for piecers 58 cents. Women employed for the same work earn from 39 to 44 cents. Dyeing is done chiefly by lads. Weaving is not very remunerative either, particularly for machine satins. The mean wage paid for this work is $2.90 per week. The prices for hand work are slightly higher, but there are at least three months a year when there is no work.

—A circular, signed by the leading firms engaged in combing, has been received by firms in the Bradford wool trade, to the effect that on and after the 1st of October the charges for woolcombing will be increased. The scale of charges for the future is as follows:

Merino wools: Wools tearing 7 and upwards of top to 1 of noil, 2d.; tearing 5 and under 7 of top to 1 of noil, 2¼d.; tearing 3 and under 5 of top to 1 of noil, 2½d.; tearing 2½ and under 3 of top to 1 of noil, 2¾d.; tearing under 2½ of top to 1 of noil, 3d.; burring, ¼d. extra; re-gilling, ¼d. extra. Crossbred wools: 56's crossbreds, 1⅝d.; 50's, 1½d.; 50's under 7 of top to 1 of noil, 1⅝d.; 40's to 46's carding, 1¾d.; 40's to 46's carding under 8 of top to 1 of noil, 1½d.; burring, ¼d. extra; re-gilling, ½d. extra. No carding to be done under 1⅜d. All qualities above 56's crossbreds to come in under the Merino Tariff. Iceland: Wools tearing over 8 of top to 1 of noil, 1½d.; under 8 of top to 1 of noil, 1⅝d.

—The U. S. Consul at Chemnitz reports that a new device has been invented for the consumption of smoke given off by locomotives, whether the locomotive is moving or standing still. It is said that this device has been added to four locomotives in Chemnitz, and that a locomotive using this new invention and being worked to its utmost capacity, saves in one month 28,600 pounds of coal. To equip a locomotive with the device costs about $25. It can also be applied to stationary engines.

—A strike was recently started in a cotton mill at Colne, Eng., because the employer declined to increase the speed of his looms.

—One of the earliest records of the weaving industry in America, is found in the will of Gabriel Harris, of New London, Conn., in 1684, in which he willed "four looms and tacklings, and a silk loom."

COTTON DEPARTMENT.

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

American Cotton Spinning Machinery.

ARTICLE XVI.

CHARLES CLIFTON HEDRICK.

(Copyright.)

First in order in considering the movements of the comb in detail, comes the feed motion. The feed rolls are driven from the main driving shaft of the comb, and, as their motion is intermittent, while that of the driving shaft is continuous, a device, called a pin and starwheel is used, which is shown in elevation in Figure 96 and in a diagram in Figure 97.

The cylinder shaft N is driven from the driving shaft A^1 by the pinion C^1 and the gear D^1. Around the hub of the gear is an adjustable plate E^2, which carries the pin F^1. Upon one end of the stud G^1 is the five-toothed star-wheel H^2, and upon the other, the draft change gear, D^2 which ranges from fourteen to twenty teeth.

Running with the draft gear is another gear J^2, of thirty-eight teeth. This is keyed to the end of the bottom feed roll C. Thus, it will be plainly seen, that any movement given to the star-wheel would be communicated to the feed rolls.

During a portion of each revolution of the cylinder shaft, the pin F^1, which describes a circle of about five inches in diameter, engages one of the teeth of the star-wheel, causing it to

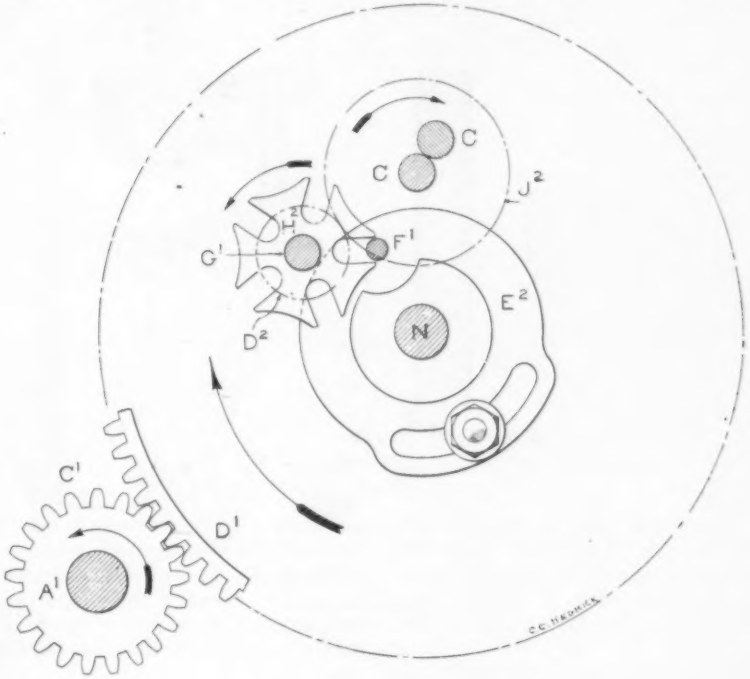


FIG. 96.

turn one-fifth of a revolution, when it remains stationary until it is advanced another tooth, by the pin at the next revolution of the cylinder. To prevent any movement of the star wheel, while it is not being acted upon, the face of its teeth are made concentric with the plate E^2 on the hub of the gear D^1, with which it is in contact.

The movement of the feed roll, at each revolution of the cylinder shaft, is very slight, for the largest draft gear (twenty teeth) will cause the feed roll, which is three-fourths of an inch in diameter, to deliver only about one quarter of an inch of cotton.

The lap rolls, upon which the lap rests, are also given an intermittent motion, corresponding to that of the feed roll, and are driven at one end of the comb, from the bottom feed roll.

All the various parts of the comb are timed to operate in regular order and, as each part is dependent upon the others, any very great variation from the proper timing will cause bad work and injury to the combs and needles.

The parts are set by the index or timing dial, which is on the head end of the cylinder shaft and is shown in the diagram of the gearing (Figure 97) but is omitted in Figure 96. The dial is divided into twenty parts, numbered 1 to 20, each part being subdivided into quarters. Above the dial is an index finger fastened to the comb frame. In setting, the driving shaft is turned by hand, until the index finger points to the proper figure.

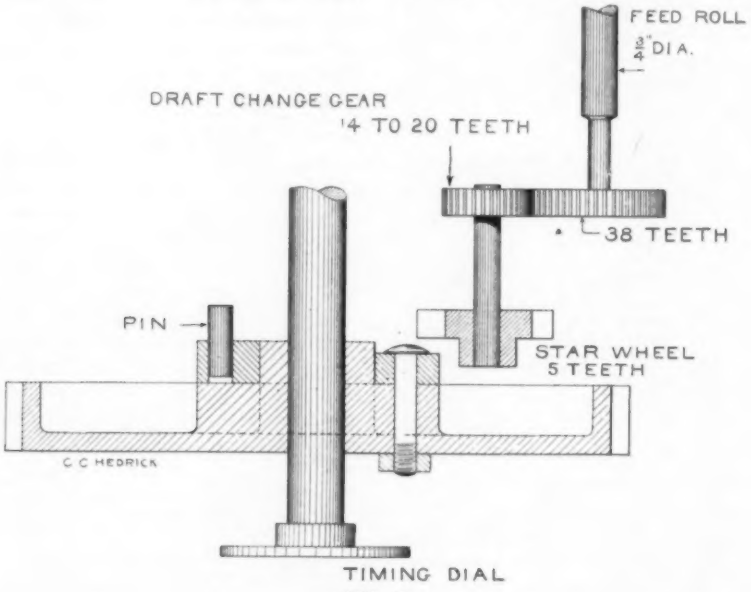


FIG. 97.

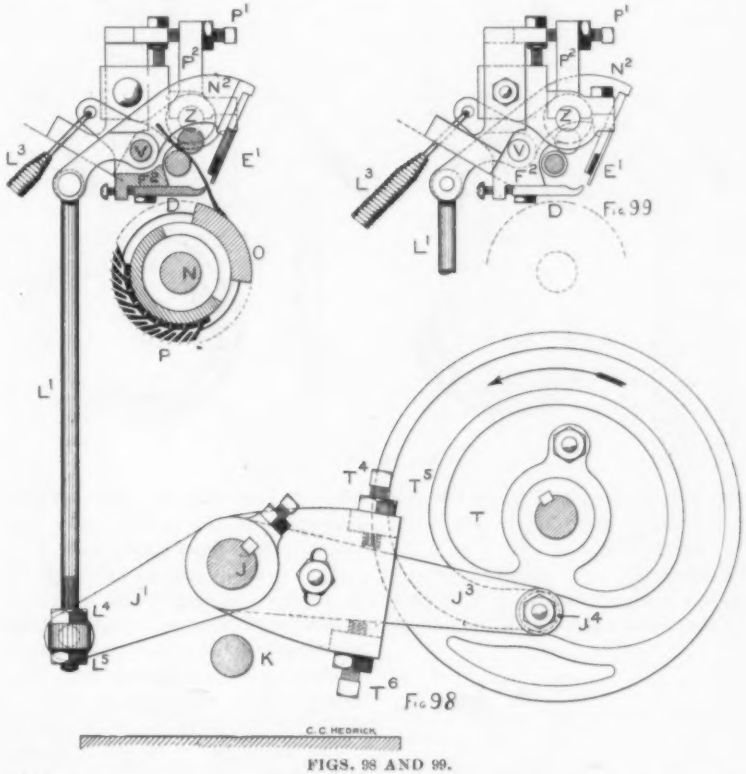
The feed rolls are usually timed to commence turning at about 4½.

Figure 98 shows the cam and levers for operating the nipper and cushion plate and Figure 99 shows the parts detached from the cam in elevation.

The cushion plate D is generally of steel with a dull-pointed edge and the nipper knife E^1 also of steel, is recessed to receive a cushion of leather or rubber. This cushion prevents the fibres from becoming cut or otherwise injured, when the cotton is gripped by the cushion plate and nipper.

Both the cushion plate and the nipper are carried by a cradle F^2, which has a slight rocking movement around

its fulcrum at Z. The nipper arm N^2 is also hung upon a fulcrum on the cradle at V. In the upright cradle arm P^2 is the nipper setting screw P^1, which bears against a stop, formed by the frame of the comb. The cradle is held in its normal position, which is with the screw bearing against the stop, by a strong spring L^3, one end of which is fastened to a horn on the



FIGS. 98 AND 99.

T^6. The part, carrying the screws, is keyed to the nipper shaft J. This shaft runs the whole length of the comb and to it are also keyed the horizontal nipper shaft levers J^1, which connect with the back end of the nipper arms N^2, by the upright rods L^1. The nipper cam makes one revolution to one of the cylinder and at each revolution the opening and closing of the nipper and cushion plate takes place, which corresponds to the movements of the cylinder.

cradle, the other to the frame of the comb.

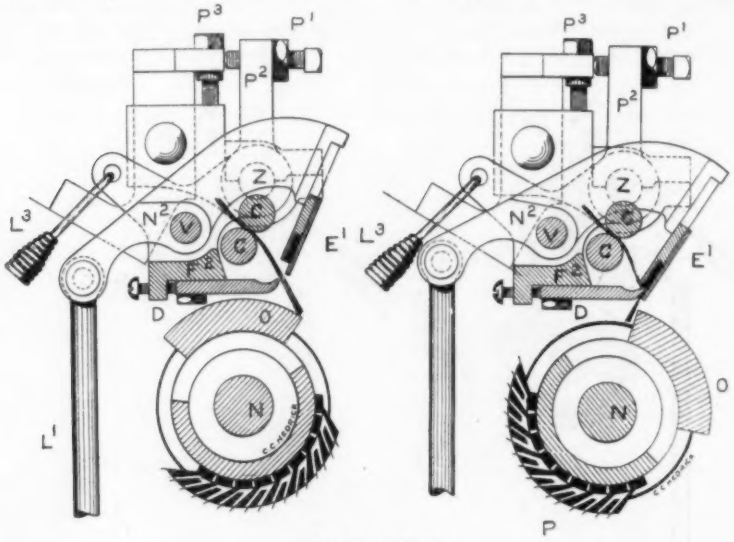
The connection to the nipper cam T, by which the nipper and cushion plate are caused to open and close, is by means of the upright rod L^1, the horizontal nipper shaft lever J^1 and the nipper cam lever J^3, which carries a roll J^4 that works in a groove T^5 in the face of the nipper cam.

It will be seen that the nipper cam lever J^3 is made in two parts, which enables a very fine adjustment to be made by means of the screws T^6 and

To follow these movements, Figures 100, 101, 102 and 103 have been made. Figures 100 to 102 are sections showing the different positions of the nipper and cushion plate in relation to the fluted segment and half lap. Figure 103 is a diagram of the nipper cam, showing certain points, which correspond to the figures on the timing dial.

In Figure 100, it is assumed that the

needles have finished combing and the nipper and cushion plate are open to allow the fibres to be drawn forward by the fluted segment. The opening movement commences at about 3½ by the timing dial. The front edge of the fluted segment comes against the



FIGS. 100 AND 101.

fibres and is about half by, when the cushion plate and nipper are wide open, which is at 6½.

By referring to the diagram of the nipper cam (Figure 103), it will be seen that the point marked 6½ is just at

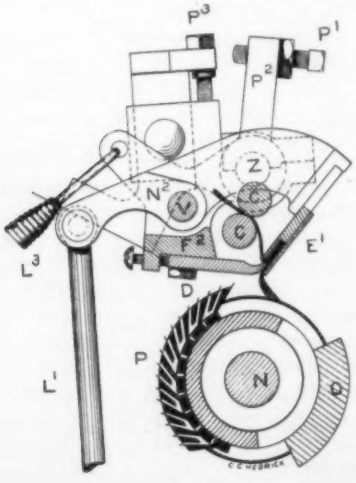


FIG. 102.

the cam roll and the index finger points midway between 6 and 7 on the dial. As the nipper cam continues to turn, the nipper cam lever J^3 is depressed, owing to the shape of the groove in which the cam roll T^4 runs. This depression causes the nipper shaft to turn slightly and an upward movement of the rod L^1 takes place, through the nipper shaft lever J^1.

The upward movement of the rod L^1 causes the nipper arm N^2 to turn about its fulcrum at V, which brings the nipper knife into contact with the cushion plate, gripping the cotton firmly. This takes place when the dial is at 9½, as shown by Figure 101.

The back edge of the fluted segment has passed by the front of the cushion plate, and this brings that portion of the cylinder, which is smaller in diameter than the segment and half lap, just under the cushion plate and nipper, and permits the end of the lap, which is held suspended between them, to assume a position, so that the needles of the half lap may thoroughly comb the mass of cotton.

We have seen in Figures 100 and 101, that the movement of the nipper arm N^2 is simply around its fulcrum V, but, as the nipper cam continues to revolve, the nipper cam lever is

moved away from the centre of the cam, causing a still greater depression of the nipper knife. It is evident that it must bear with considerable more force against the cushion plate. This pressure causes the spring L^3 to yield and the cradle to move slightly around its fulcrum Z, as shown by the position of the parts in Figure 102.

Ring Frame Thread Protector.

The illustration shows a ring spinning frame equipped with the protector invented by Messrs. Schedelbauer and Wall of Amsterdam, N. Y. This protector, which has been in use in the Sanford Mills, at Amsterdam, for some time, has been subjected to comparative tests with frames

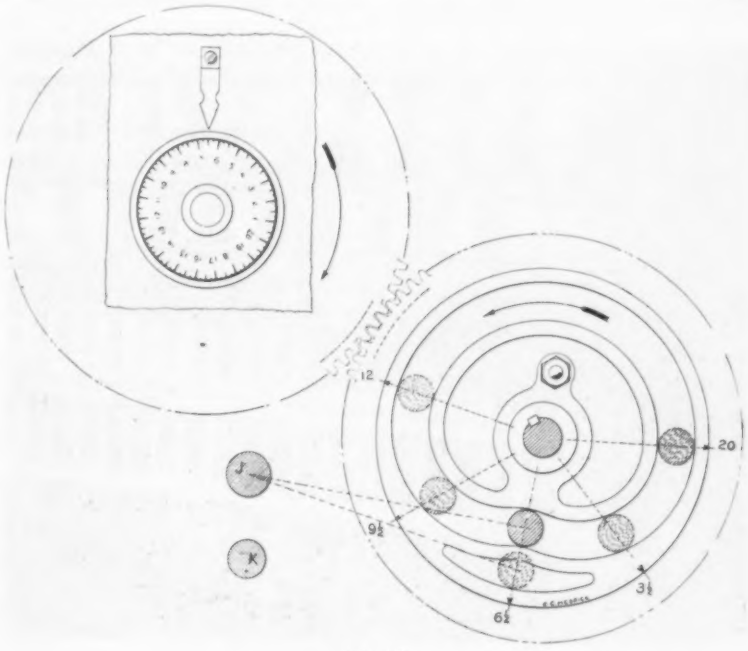


FIG. 103

This double motion of the nipper knife, first around its own fulcrum and then around the fulcrum of the cradle, brings the cotton down near the needles, just previous to the commencement of the combing action. This occurs when the timing dial is at about 12; the parts remain in this position until all of the needles have passed through the cotton, which is at about 20. The nipper and cushion plate then commence to raise up from the cylinder into a position, so that the cotton may be detached and then open and the cycle of movements is repeated.

equipped with the protector and those running without it, side by side. The results have been very satisfactory.

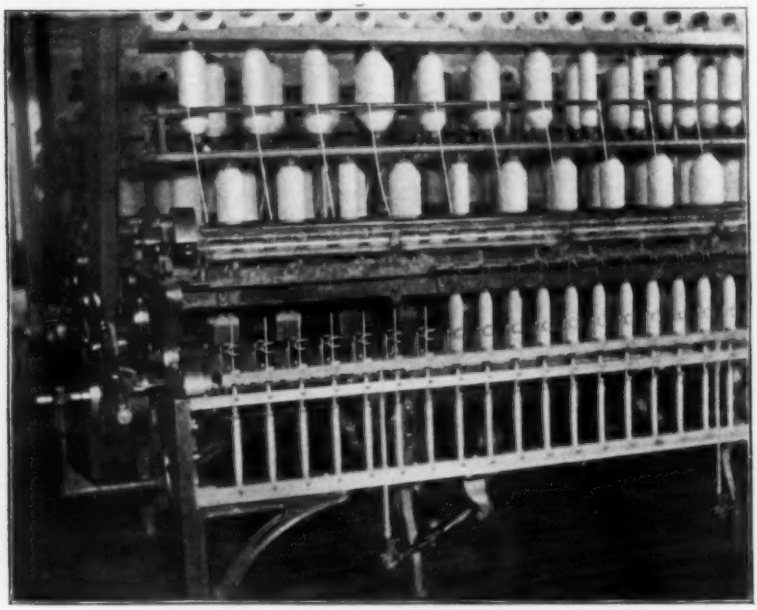
It has been found by these tests that the amount of yarn which can be wound on a bobbin if the frame is equipped with the new protector, is increased to such an extent that the frame can be run 35 minutes longer without the necessity of doffing. The frame without the protector ran two hours and 35 minutes, while the frame with the protector ran three hours and 10 minutes.

The results of the test of the two frames are as follows: Test made in

the mills of S. Sanford & Sons, Amsterdam, N. Y., on the 22d day of August, 1900, with Ring Frame Thread Protector.

Number of spindles	192
Lift of frame	7 inch.
Size of ring	2¼
Size of yarn spun, cotton No.	10.43
Counts of twist	14.66
Weight of doffing with protector	48 lbs.
Weight of doffing without protector,	26 lbs.
Length of yarn on each bobbin with protector	18 leas or 2160 yds.
Length of yarn on each bobbin without protector	10 100-120 leas or 1300 yds.

of the roll can be increased from one quarter of an inch to an inch, if the frame permits, thus allowing the use of longer bobbins. Their experience in the use of the protector leads them to believe that the life of the traveler is prolonged fully 15 per cent. by the new protector, owing to the more even tension under which it is held, its position being nearly perpendicular at all points during its revolution, as



RING SPINNING FRAME WITH THREAD PROTECTOR.

It is well known that a great deal of time is consumed in doffing, and that here is a great chance for economy, and that any reduction of this time increases the production of the frame.

The manufacturers of this new protector base their claims not upon the enthusiasm of the inventor, but upon practical tests made at Amsterdam. They state that by the use of the device the production will be increased from 25 to 30 per cent. over the frames without any protectors, and from 12 to 15 per cent. over the frames equipped with the ordinary blade protector. They state that the traverse the yarn is under a continuous tension.

The imperfections and damage caused by striking suddenly against the blade separator is avoided. It is claimed that by its use the frame and rail are more perfectly balanced. Heavier travelers can be used, and consequently the yarn is wound tighter and more uniformly on the bobbins. It is stated that there is a material saving in time, on account of fewer ends breaking, and that the quality of the yarn is increased, and an operator can run more spindles in consequence. Its construction prevents the accumulation of lint, dust and dirt. A con-

siderable saving in power also results, as compared with the power required for driving the separator now in common use. Further information as to this protector can be obtained from the manufacturers, The Ring Frame Thread Protector Co., Amsterdam, N. Y.

Best Length of Taper on Mule Cops.

The best length of taper on a mule cop, is that which will give the maximum length of yarn on a cop of any given size, and at the same time permit of the yarn being unwound with the smallest amount of breakage and waste.

When the taper of the cop is shortened, it of course is possible to get a longer length of yarn in the cop, but a short chase means that the chance of a cop splitting or throwing off the yarn in bunches, is much greater than on a longer chase, for the short chase lacks the binding and friction in unwinding that the long chase affords.

Again, unless the rail and copping plates on the mule are of a correct snape, set and adjusted so as to build a good, well bound cop, a moderately long chase will always give better winding and spinning, and make a better cop in every way than a cop with a short chase built on a mule on which the rail and plates are a bit out of kilter. When the rail of a mule is in such shape that a bunchy nose is built, or perhaps a better way to put it is to say, when there is a strong tendency to build a loose, bunchy nose, a short chase will always show up the trouble a great deal worse than will a long chase.

Right here lies the principal reason why a good many mules are set to build a rather long chase. This is done so that there will not be as much trouble from the soft halched noses. There is one make of mule especially subject to this very troublesome fault, and the only remedy is to have the extreme end of the copping rail cut off to a much sharper angle than they have when sent from the shop.

The illustration shows what we are using for a cop on medium counts of yarn. It has a chase of an inch and a half long when the cop is full; this chase is two and a quarter inches long at the shoulder, or place where the cop attains its full

TAPER FOR COPS ON MEDIUM COUNTS.

diameter; the first stretch of yarn wound on the spindle is an inch and a quarter in length, and from this to the shoulder the chase gradualily lengthens, at which place the chase is the longest of any point in the cop. From the shoulder to the nose the chase gradually shortens. The chase is

made long at the shoulder to bind the cop more firmly together, when it is too short in proportion to the diameter of the cop there is sure to be a lot of trouble from cops breaking in the shuttles.

The loose incline on the copping rail is set so as to give two and a half turns around the chase of the cop, while the faller is moving from the point of the nose to the base of the chase. The binding action that this two and a half turns sets up in the cop, and the effect that it exerts on both the strength and tenacity of the cop is considerable.

The locking point of the faller is constantly changed as the cop is built up; this is done to bring it at the same proportionate point on the chase at all stages of the building of the cop. On old mules with a solid rail it is impossible to vary the locking point as the cop is filled; as a result on the cops spun on some mules it is almost impossible to "ready" the cop if the nose gets a bit tangled.

SPINDLE.

The Allen Jack Spooler.

We show an illustration of a cotton yarn spooler designed and built by the Allen Iron Works, Adams, Mass., after the most searching investigation in American cotton mills as to how a spooler should be built.

It is designed to wind direct from the chain, saving the expense of beaming, while the results are claimed to be as satisfactory as by the beaming method.

The machine has six drums set low in plain view of the operator, and requires but one attendant. The top drum is but four feet from the floor.

The builders claim that a heavier chain can be used, and consequently one-half more yarn can be colored and wound at one time than by other methods. It can also be used to wind from a bank of spools, giving a large production.

No spooler is complete if the traverse motion is defective. The builders of this machine state that by their positive traverse without cams, an absolutely uniform motion is given to the yarn at all points of the traverse, and the spool is made level from start to finish.

The threads are brought together so that any part of them may be taken off without disturbing remainder of spool, which may be kept for future use.

In addition to the spooler the Allen

SIX DRUM JACK SPOOLER.

Iron Works build broad and narrow beamers, skein spoolers, quillers, dye and starch machines, yarn splitting machines and the Allen boiler grate.

This grate has been in use for many years. Its durability is greatly increased, as all bearings are below the fire. Each grate is separate, and can be changed from center to side when they become burned. Some of these grates have been in constant use for 15 years, without replenishing.

The builders claim they are not liable to clinker, and are proof against breaking from expansion. They can be set in brick work or on legs as desired.

In addition to their machinery, the Allen Works have a foundry and wood working department adapted for general work in these lines.

—Spots on cloth, caused by soot, can be removed by tartaric acid; they can be removed also by applying benzine at first, then use alcohol, and finish by washing in a luke warm solution of soap.

WOOLEN DEPARTMENT.

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

The Manufacture of Fancy Cassimeres and Worsteds.

ARTICLE III.

FRED BRADBURY.

The production of novel effects in fancy worsteds may always be readily obtained by any manufacturer or designer who is thoroughly conversant with the first principles of color and weave combinations, since all novelty (new things) is but a combination of simple elements. This is especially true of the above type of woven cloths, since worsted yarns are so clear and decided in character, they most readily associate or lend themselves to the emphasis of any particular effect of weave or combination of color.

These facts are particularly demonstrated in the following types of woven fabrics. A photographic representation of an actual woven structure is shown at Fig. 38, and a second photograph of an actual worsted fabric is supplied at Fig. 39.

The make of cloth and weaving plan for both these textures are the same. The difference in effect on the surface of the fabric is entirely due to the arrangement and style of coloring.

Weaving particulars for Fig. 38.

Face.

Warp:

2/36s Botany 52 ends per inch in loom.

Width in reed 64 inches.

Weft:

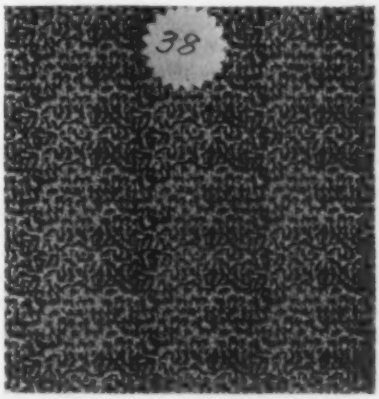
2/36s Botany 50 picks per inch in loom.

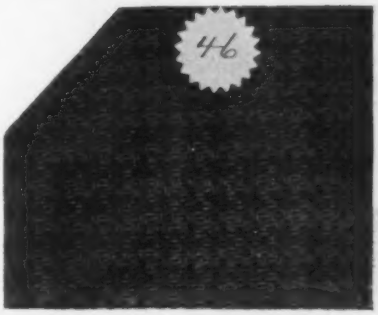
58 picks per inch finished.

Back.

Warp:

2/24s Botany 26 ends per inch in loom.





Weft:

2/24s Botany 25 picks per inch in loom.

29 picks per inch finished.

Finished width of piece 56 inches.

Finished weight of piece 21 to 22 ozs. per yard, for 56 inches × 37 inches per yard.

The weaving plan is of double structure, and contains two ends and picks of face to one end and pick of back.

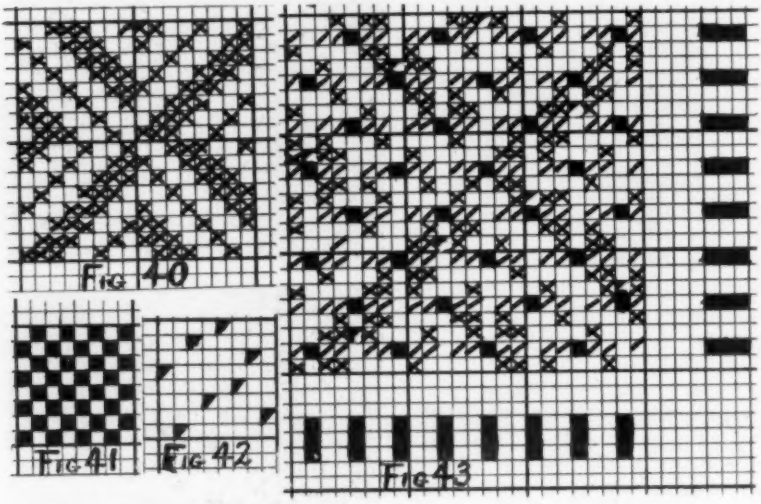
The face weave is shown separately at Fig. 40 which, it should be noted, has its base in a common eight-end twill, but designed so as to produce a simple diamond effect upon sixteen threads of warp and weft.

The back weave is also given separately at Fig. 41, which, being plain weave, needs no comment. The above two cloths are woven together, and bound to each other during the process of weaving in the special and irregular order as shown by scheme at Fig. 42.

The compound weave structure is given at Fig. 43.

The distinctive markings for face, back and bindings, shown at Figs. 40, 41 and 42, are correspondingly indicated in the compound weave structure. The additional small diagonal marks or dashes as shown, are for the purpose of separating the two cloths during the process of manufacture, by indicating that all the face warp threads must be lifted clear of the backing warp threads during the insertion of the backing weft. The black markings underneath and at the side of this design Fig. 43 indicate the warp and weft threads of the back cloth respectively.

The compound weave structure of this cloth is still further exemplified by an illustration which is shown at Fig. 44, and which represents a cross section through the warp, giving the first three picks of design supplied at Fig. 43. Scheme of coloring for Fig. 38.



Face warp:

2 threads dark brown, 1 " slate } for 8 times.
1 " dark brown, 2 " slate } for 8 times.

48 threads in each repeat of pattern.

Face weft:

2 picks dark green, 2 " fawn } for 6 times.
1 " dark green, 1 " fawn } for 12 times.

48 picks in each repeat of pattern.

Back warp:

2 threads dark brown, 1 " slate } for 4 times.
1 " dark brown, 2 " slate } for 4 times.

24 threads in each repeat of pattern.

Back weft:

2 threads dark green, 1 " fawn } for 4 times.
1 " dark green, 2 " fawn } for 4 times.

24 threads in each repeat of pattern.

The combined effect of color and weave at the back of this cloth is shown at Fig. 45. The markings above and at the side of this pattern coincide with the commencement of the back warping and filling scheme and back weave plan Fig. 41. A range of patterns produced in this style of coloring which yield most satisfactory results

Face weft:

2 threads green, 2 " drab } for 6 times.
1 " green, 1 " drab } for 12 times.

48 threads in each repeat of pattern.

Back warp:

2 threads brown, 1 " deep lavender } for 4 times.
1 " brown, 2 " deep lavender } for 4 times.

24 threads in each repeat of pattern.

Back weft:

2 picks dark green, 1 " drab } for 4 times.
1 " dark green, 2 " drab } for 4 times.

24 picks in each repeat of pattern.

Fig 44

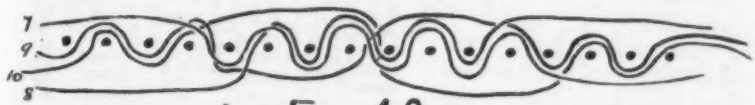


Fig 48

is enumerated below, arranged under the heading of dark and light shades, and which are intended for face warp and weft and back warp and weft respectively, and consequently produce no cross colorings as in the sample supplied, though in the case of this latter sample a most harmonious and pleasing effect of color is the result of such crossing or accidentals.

Sect.	Dark shades.	Light or medium shades.
I.	Black.	Slate.
II.	Dark brown.	Medium steel mixture. (Navy and white.)
III.	Navy.	Dark lavender.
IV.	Dark smoke.	Light smoke.
V.	Black.	Navy & white mixture.

For the photographic illustration of an actual woven texture supplied at Fig. 39, the make of cloth and weave is identical with particulars enumerated in connection with Fig. 38.

The scheme of coloring, however, is different, and the details for the same are given herewith.

Face warp:

4 threads black, 4 " slate } for 3 times.
2 " black, 2 " slate } for 3 times.

48 threads in each repeat of pattern.

At Fig. 46 another type of worsted fabric is shown which differs very considerably in structure from either of the two foregoing woven textures. In the photographic illustration submitted, there is only a little over one repeat of pattern shown in the warp threads and rather less than one complete repeat of pattern in the weft, but this is sufficient to clearly indicate the character and style of cloth under discussion.

The star effect is produced by employing a warp and weft rib design, and using 16 threads of dark and 16 threads of a medium color in the warp with the corresponding numbers in the weft; this scheme produces a continuous series of small star effects on the surface of the cloth, but a change in the warping and wefting plan to 12 threads dark and 12 threads medium shade respectively, slightly modifies the star effect and thus produces the subdued check pattern. The complete particulars of make, weave and color are as follows:

Warp:

2/32s worsted counts (all wool).

88 ends per inch in loom.
Width in reed 64 inches.
100 ends per inch finished.

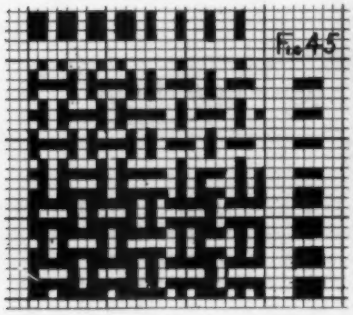
Weft:

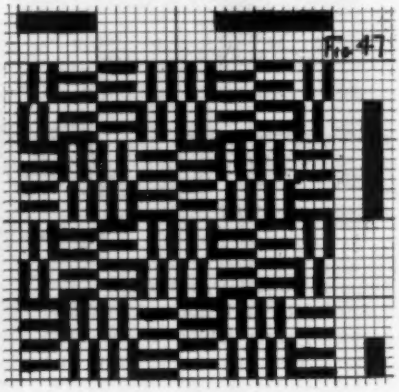
2/32s worsted counts (all wool).
80 picks per inch in loom.
100 picks per inch finished.

Width of finished fabric 23/to 24 ozs. per yard for 56 inches by 37 inches per yard.

The complete design is given at Fig. 47, one repeat of which occupies 16 ends and picks.

One complete repeat of weave and color cannot conveniently be shown on paper for lack of space, but the commencement of the color scheme is indicated at the side and above the design (Fig. 47). These markings, it should be noted, coincide with the commencement of the warping and wefting plan which is given below.





Scheme and order of warping:

8	threads	dark smoke.	
12	"	medium smoke.	
12	"	dark smoke.	
12	"	medium smoke.	
16	"	dark smoke	for 128
16	"	medium smoke	threads.
12	"	dark smoke.	
12	"	medium smoke.	
12	"	dark smoke.	
12	"	medium smoke.	
4	"	dark smoke.	

224 threads in each repeat of pattern.

Scheme and order of filling:

4	picks	dark smoke.	
12	"	medium smoke	for 96 picks.
12	"	dark smoke	
16	"	medium smoke.	
16	"	dark smoke	for 96 picks.
16	"	medium smoke	
12	"	dark smoke.	

224 threads in each repeat of pattern.

The structure of this cloth, Fig. 46, is still further illustrated by a cross-section through the warp, Fig. 48, commencing with and showing the interlacing of the 7th, 8th, 9th, and 10th picks with one repeat of the warp threads in design 47.

For the same make of cloth and style of coloring, the following analogous colors produce a very good range of patterns of subdued colorings for suitings.

Section I.	dark drab / medium drab	warp and weft.
Section II.	dark brown / dark smoke	warp and weft.
Section III.	dark brown / medium steel gray / mixture	warp and weft.
Section IV.	navy blue / dark lavender or slate	warp and weft.

—A dilute solution of ammonia or chloride of zinc is recommended to remove mould spots.

Soaps and Oils.

J. SPENNRATH,
Seifensieder Zeitung, Augsburg.

While the oily substances are not the only impurities of cloth, they are the most important. The size applied to the yarn before weaving is still another impurity, but if the size were the only substance to be removed, the cloth manufacturer would not have very much difficulty in cleaning his goods with clear water, without the use of soap.

The fatty substances in the wool

produce spots and shades, if they are not thoroughly removed. These oily substances are sticky, and, consequently, retain the dust which may fall on the fabrics. It is for this reason that oil spots which are invisible when the goods are finished, become quite apparent after the goods are exposed to the air.

As all of the oil which is used on the stock must be removed before the goods are finished, great care should be taken to use only such oils as can be easily saponified, and a neglect of this simple precaution often causes great difficulty in the manufacture of woolen goods. Any animal or vegetable oil can be safely used on wool, if it is saponifiable and capable of being easily dissolved at a normal temperature.

The principal oils used at the present time in woolen manufacture are the olive oil and Oleine. Large quantities of betterave oil are mixed with olive oil to cheapen it, and chlorophylle is added to give a green color, similar to that of the olive oil; but, as a matter of fact, the betterave oil makes a very good oil for wool, as it can be easily saponified, and serves its purpose well as a lubricant on the fibre.

Oleine, which is a by-product in the manufacture of stearine, is also a very good substance for oiling wool, and is largely used in the manufacture of soap. Although it is not equal to the neutral oils, especially olive and betterave oil, on account of its being somewhat acid, yet at the present time it is used almost entirely in oiling wool. When Oleine was first used for oiling wool, it was considered a great step forward in textile manufacture. It dispensed with olive oil and reduced the cost of oiling, and made the scouring easier and cheaper.

Formerly, large quantities of olive oil were used in Europe for oiling wool. At present, betterave oil is used for the lower qualities of wool. The goods are scoured with soap, of which from 16 to 20 pounds are used for each 100 pounds of cloth. In addition to this, from 40 to 50 pounds of Fuller's earth are used at Louviers and Elbeuf, for each 50 yards of cloth. This is applied in the fulling process.

If Oleine is used on the stock, the scouring is a very simple operation, as the Oleine is so easily saponified. To scour goods where the stock has been oiled with Oleine, from 2 to 2½ pounds soda crystals are substituted for 10 pounds of soap. This process greatly simplifies the work. The goods, as they come from the loom, are soaked in a solution of soda, which saponifies and removes the oil in about one-half an hour, and the liquor, which becomes a kind of soap, by reason of the combination of alkali and the oil, can be used for fulling goods. At Sedan, where fulling is the first process after the goods are woven, this soda solution is used in the fulling mill, and a large amount of soap is saved.

Dewsbury Low Grade Goods.

S. B. H.

To speak of the nature and character of the textile fabrics produced in the heavy woolen district of the West Riding of Yorkshire, is synonymous to saying that here we have a class of fabrics that stand by themselves, and which for quality, character, and price, have no rivals in the old or new world. Their fame truly has gone out to the ends of the earth, and Batley and Dewsbury today are as well known at the Antipodes as they are either in New York or London.

A walk through the streets of Dewsbury and Batley, or the surrounding large manufacturing villages, would give even a casual passer-by the impression that this is indeed the home of rags and stockings, woolens and worsteds, and all the other appurtenances relating to the manufacture of woolen cloths.

But why is it that Batley and Dewsbury occupy such a prominent place in the manufacturing world? Simply because her manufacturers for the past century have made a special study in producing goods, whose most pronounced feature is a blending together of what many people would

call the refuse of the world, and out of which there has been evolved fabrics most attractive in design, and best of all to the wholesale clothier at a price per yard which is indeed astounding.

When tariff conditions in the United States favored English manufacturers more than the present fiscal arrangements, New York importers revelled in buying "Charlie" Scarth's meltons at 5d. per yard 42 inches, other manufacturer's serges at fron 8d. 54 inches, beavers, presidents, low worsteds, and fancies at corresponding prices, and many wondered how they were put together for the money.

To those conversant with the conditions prevailing in the heavy woolen districts, there is no secret attached to their manufacture; suffice for me to say that it is the quantity of pieces turned out per week which plays a very important part in determining profit or loss with Batley manufacturers. Things are done and cut very fine, most manufacturers being content to sell their pieces at absolutely cost price, and to work for mill profits alone. This may sound strange to the ears of American manufacturers, but if they knew the competition with scores of manufacturers making the same class of goods, they would be able to understand why it is the producers in this district are content if they can keep the wheel going round. Some mills in this locality of an average size reckon their mill profits at from one to two thousand pounds per year, and this is not a bad thing when the much coveted American market is shut off.

As before said, the manufacture of cheap woolens has engaged the attention of manufacturers in Dewsbury and neighborhood for more than a century, and unlike certain other districts in Yorkshire, they have attempted the production of woolen cloths whose specialty has been cheapness. I am within the mark when I say that there are dozens of mills in this district who never buy a single pound weight of wool from January to December, the chief raw manufacturing products being mungo, shoddy, stockings, and last but not least, American cotton.

Pre-eminently rags, both new and old, enter very extensively into the manufacture of woolen cloths, and so extensive a trade is transacted weekly around Dewsbury, Batley, and neighborhood that this centre has become known as the home of the mungo trade. Unlike many manufacturers situated around Leeds, Pudsey, Yeadon, Huddersfield, and the Colne valley, Dewsbury manufacturers have long ago dispensed with the mungo manufacturer proper, they themselves buying the rag and producing the mungo themselves.

Of course, it should be remembered that rag sales are held in Dewsbury two and three times every week, thus affording local manufacturers an opportunity of easily attending, and buying anything that they consider worth attention. This is a point in the manufacture of woolen cloths which I would specially press home upon American manufacturers. Every Batley manufacturer of note has a plant put down of his own by which he can produce as much mungo as he requires. Such a plant is by no means an expensive one, comprising a shake-willey, and a rag-grinding machine, two items of which will not run into very heavy figures.

The advantages of a manufacturer being a producer of his own mungo and shoddy has very much to recommend itself. The writer of this having spent a good number of years in the manufacture of woolens, has often seen 50 per cent. difference in the value of mungo made from the rag, and the same quality of mungo bought from firms purporting to be mungo manufacturers.

The art and science of mungo manufacturing today as practiced by shoddy manufacturers in general is one that lends itself to a good deal of adulteration, and when a manufacturer buys mungo from one who is a mungo manufacturer, he does not always know what he is buying. Let me illustrate. I go to the Dewsbury sales and purchase five or six bags of new

linsey worsteds, which I put through the rag grinding machinery, after being properly oiled, and which gives me a nice, shafty, light mungo of a good color. Sometimes I have bought what was supposed to be a black new linsey mungo, made by a mungo manufacturer, costing just about the same figure as my own made mungo did. But experience has proved not simply in my case, but in the case of a score of other firms I could mention, that my own made mungo has produced a cloth worth at least 2d. per yard more than the cloth made from the mungo bought from another party. It has been clearly demonstrated that the mungo manufacturer has adulterated his mungo with probably 25 per cent. of old black linsey rags, while possibly the quality of the oil by which his rags were greased was considerably poorer than that used by me.

Nor is this all. Considerable saving is made by the delivered weight of yarn after being scribbled and spun, while there was no comparison in the free working of my own material when compared with that bought, there being not only a heavier weight of spun yarn, but also a far better, softer, and fuller thread. It is through scores of such experiments as these that Batley manufacturers have effected considerable saving in the production of their fabrics, and every firm from Mark Oroyd & Sons, Ltd., who operate four mills, to those operating two and three sets, every one has a rag grinding plant in connection with his mill, the saving of which is effected in two years' time. I specially recommend to American manufacturers the making of their own mungo in preference to buying it from mungo manufacturers. When it is bought from the latter firms a man never knows how much the mungo has been faked.

Possibly 50 per cent. of the trade of the heavy woolen districts is what is known as a plain trade. That is, a cotton warp is used, the filling being mostly a grey or drab woolen thread. After being woven, the pieces are dyed to any required shade.

But it will be seen that in the case of the plain trade a considerable saving is effected in the blending of the materials. It is no uncommon thing for a Batley manufacturer to put down a blend comprising 3500 lbs. of mungo, and 500 lbs. of cotton, for one blend. Such a mixture as this will take just a little passing through the machines, and these always being kept running, it is far different from constantly mixing a few stones in the making of small blends. A machine starts today on a gray mixture and it is scribbling the same mixture six months hence. The length of staple being the same, the machine requires no alteration but simply "fettling" at stated times, this being a means of great saving to Batley manufacturers. The great object in view of all those operating mills in this district is to keep the machines working, for if this is not done, they know that a serious loss is the only result, consequently every nerve is strained to keep going the scribbling and spinning machinery.

What more easily made fabric is there than cotton warp meltons, which are made by the thousand every week in Batley, Morley, Dewsbury, Osset and neighborhood? Such cotton warp as is needed is spun in America in many a New England mill, and all that is then needed is simply a low grade shoddy weft.

Being most intimate with a manager for one of our district manufacturers engaged in the production of these classes of fabrics, I recently asked him as to how they made their meltons. Quite frankly he gave me the following interesting particulars which are worth the consideration of your readers. Here are particulars of a blend of materials that had recently been through the machines: 1750 pounds of mungo costing 1¼d. per pound; 84 pounds of white Texas cotton at 7d. per pound. These two materials were the sole constitution of the blend, and were scribbled and spun to 9 skeins weft. The cost of scribbling,

spinning and weaving ran out to just 6¼d. per pound weight in the cloth, which is indeed a marvel of cheapness. For making these meltons and unions a Lancashire spun cotton yarn is used for the warp, which costs about 6s. 6d., and this 9 skeins shoddy weft is used for filling.

For weaving these pieces the weavers were paid 8 shillings for 90 to 100 yards length pieces. When all other charges were added, such as mill expenses, dyeing and finishing, they were able to produce and sell to the Manchester shippers a melton cloth weighing 11 to 12 ounces to the yard, 50 inches wide, at the nominal figure of 9¾d. per yard.

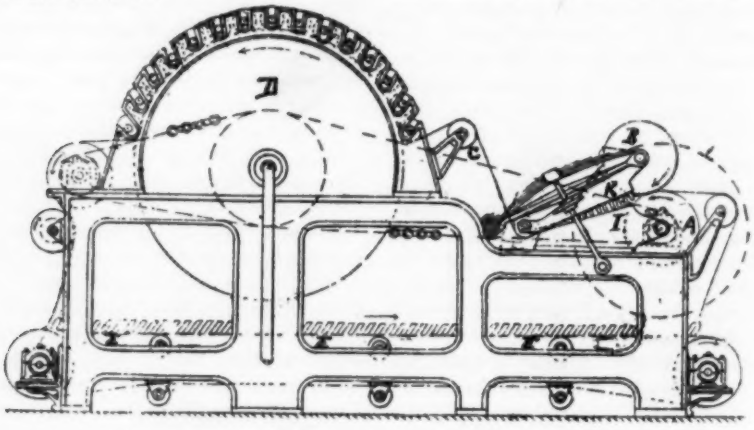
Whether or not the making of such a class of fabric as this is worth the candle, is not for me to say, but it seems that so long as United States manufacturers have the cotton yarns upon the spot, with plenty of raw woolen material available for the filling, not only this but a lot of other grades of woolens and worsteds at present imported could be profitably made at home. Possibly we may have something further to say upon this subject later on.

Fulling in the Open Width.

The illustration represents a machine recently invented in France, and described in L'Industrie Lainiere, for fulling woolen goods in the open width.

The cloth is drawn by the heavy squeeze rolls A and B, and forced between the plates I and K, which are farther apart at the front than at the rear end. The cloth is packed tightly between these rolls and escapes through the narrow space at the rear, and from that point is carried over the roll C where it is sprinkled with the fulling soap solution.

The cloth is then carried over the large cylinder D, and at same time is squeezed by the numerous small rollers which rest on the large drum and



MACHINE FOR FULLING CLOTH IN THE OPEN WIDTH.

are revolved rapidly by contact with the moving cloth.

The goods are carried from the drum to an apron E under the machine, which slowly carries the goods in folds to the other end of machine below the squeeze rolls. The fulling is effected between the rolls A and B, and also between the cylinder D and the small rollers above.

It is claimed that this machine fulls the goods while keeping the cloth opened up and free from wrinkles, and thus avoids mill streaks.

It cannot fail to interest manufacturers as a novelty at least, and even if this invention is not perfect, it may carry a suggestion for an improvement on fulling machinery.

KNITTING DEPARTMENT.

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

The Knit Goods Situation.

The knit goods business, speaking at large, is in much better condition than is usual on the eve of presidential election. The general tone is firm, and while no decided advances are positively promised, the chance for material weaknesses seems remote.

The tendency in every department is toward fancies, which are likely to be in increasing request for many months. Indeed, such goods will scarcely wane in popularity before a long wave of business depression sets in.

Seamless hosiery has been more active for ten days, but the strong position of raw cotton caused spinners to become indisposed, curtailing the acceptance of orders by producers. It now looks as if the Chinese difficulties would be cleared up; if so, yarn will jump for a short time, at least. Many manufacturers have not covered themselves on yarn, and doubtless intend to throw their orders overboard in case the Chinese demand is suddenly opened.

Imported staple hosiery has been in brisk demand for a month, due in part to the known fact that receipts from Germany are steadily shrinking. American manufacturers ought to take advantage of this state of things, which is due mainly to an increased European call. The rise in foreign prices has cut off some American orders, so it is hard to forecast what effect a further advance in yarns would have. Split feet are ahead in foreign orders for spring delivery.

The heavy weight business so far has been fairly satisfactory. The firmness abroad helps no line more than fancies, and of these it is significant that vertical stripes are in particular demand by men, as well as women, although such are especially costly. Plain lace and embroidered goods are coming forward in the spring orders. Drop stitch effects are popular, also diamond effects, in lace, combined with various colors sharply contrasting, such as pink and green, silver and pink, cardinal and black, purple and white, black and white, pink and black, lilac and black, pink and white.

The increasing use of Egyptian cottons is noted, giving a strikingly finished appearance. Underwear also shows the trend toward brightness in the samples of spring athletic goods.

The lack of duplicate orders on heavy weights is beginning to make manufacturers solicitous, although original orders were generous. Last year the circumstances called for anticipating; so the two seasons being unlike, can scarcely be fairly compared. Some manufacturers appear to think that there is no need of placing a limit on advance orders.

The yarn situation has added tone to what until within ten days has been a rather slow demand through the market at large. Trade at the jobbing centers is unquestionably somewhat later than usual; in the end it is likely to reach a very respectable average.

Advance order business for spring is over and seems to be generally satisfactory; particularly on fine ribbed goods. Among the spring orders many lace and pure silk goods were included, along with striking mixtures and gay effects. Unquestionably the fine lines of ribbed goods imported of recent years, have stimulated the call for domestic goods of this description, now being enjoyed. Hand finishing, especially on lace goods, is being tried by several domestic producers.

Seaming and Trimming Machines.

(Continued from October.)

A peculiarity of this W. & G. stitch, is that it leaves all the thread ends on top side of the work. The stitching which appears on top is the under, or looper thread.

The Overlock Overseaming machines are driven direct from a pulley on the shaft under the table, and a speed of about 2700 stitches per minute gives the best results; 14 stitches to the inch is about the thing, subject to modification as per requirements. For light weight knit goods, use No. 60, either 3 or 6-cord Soft Finish thread for upper needle, and about No. 14 to 18 cop yarn for hook needle. For heavy knit goods, use about No. 60 Soft Finish thread for upper needle, and about No. 12 cop yarn for hook needle. Tensions must be kept clean and free from dirt. If they are strictly attended to, little or no trouble will appear because of them. The tightness of the stitch and the position of the lock of the two threads is regulated by the relative amount of Tension on the two threads. Tightening of the upper tension will cause the seam to be made tight, while loosening it and tightening the under thread will allow the seam to flatten and open out.

The "Union Special" Seaming and Trimming Machine, which resulted from the combination of the Union Bag Machine and the Dewees Trimmer, appeared on the scene about 1885. The latter device trims the edges of the seams simultaneously with the sewing, by the abrasion method, a method so universally known and used that a detailed description seems hardly needed. It is an original, unique and effective device, requiring no sharpening of knives, is durable, can be operated at a high rate of speed, makes a clean edge, and the amount of fabric beyond the seam can be regulated to suit any material. This device will perform its work satisfactorily for days with practically no attention whatever other than the ordinary oiling of its parts. It has stood the test of years, and the fact that it is so largely in use indicates that the claims made for it are well grounded.

This machine makes the "Safe Elastic Stitch" seam, formed of two threads, as illustrated by diagram A, in Fig. 3, and is claimed to be very strong, each stitch being fastened and independent, so that the seam will not rip, and is very elastic, being equal to the full stretch of the fabric. Diagram B, in Fig. 3, shows the seam after first operation. No bobbins are required for these machines as they take all their threads directly from the spool, doing away with the winding and nuisance of bobbins. It is well constructed by competent and efficient workmen, in their own factory, on a splendid system

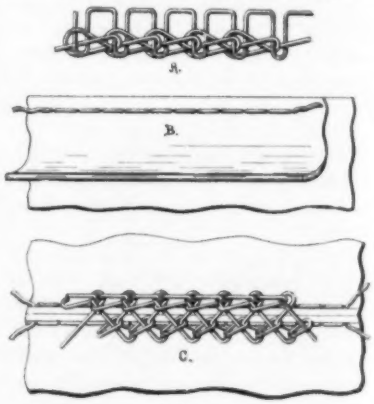


FIG. 3.

whereby interchangeability and excellence of parts is assured, of the best material to insure durability, is capable of high speed, requires a minimum of outlay for repairs, and is, taken altogether, a fine product of mechanical skill.

After the seaming and trimming operation, the seam is then submitted to another operation, which employs one of the best designed machines built by this company. This is a side-wheel, cylinder, two-needle machine, especially adapted to cover trimmed seams on knitted fabrics. The cylinder is small, 1 3/16 in. in diameter, and permits covering the seam of a very small sleeve or leg. Two parallel rows of stitches appear on the upper sur-

face of the material, or outer side of garment, while on the lower side of material or inner side of garment, the rows of stitches are interlocked by a thread which entirely covers and draws down flat that portion of the fabric beyond the seam, greatly improving the appearance of, and strengthening the garment. The seam being flat will not produce discomfort to the wearer, and has proved itself to be very popular and durable. The accompanying diagram C, in Fig. 3, shows the covering thread which appears on the inside of garment after the second operation.

In adjusting the trimmer on the "Union Special," both upper and lower toggles must first be ground on a true circle, with centre of each one, which is easily done on the small grinder furnished with this machine. The upper toggle should then be dressed to a small round on its circular edge, so that its contact with the lower toggle will be but a very narrow edge, with no sharp corners. The lower toggle must be left straight across its circular edge, to provide a flat seat for its mate.

To adjust toggles, fasten lower toggle in the toggle frame by its fulcrum and clamp screws, and see that it is at the proper height in relation to the feed, means for this purpose being provided by a wedge with thread and nut at one end which lie in the toggle frame beneath the fulcrum block. The height of this toggle should be with its circular edge about half-way between top of throat-plate and top of feed dog when the latter is at its highest position; then fasten upper toggle in place and move it down to the lower one by means of its wedge, so that they touch each other. It may be found on testing them with a piece of cloth that they will need a trifle closer adjustment, but care must be taken that they do not press against each other any harder than is necessary to trim the cloth cleanly, for too much pressure will produce unnecessary wear and is liable to break the edges of the toggles.

To adjust for width of fabric beyond the seam, move the whole toggle frame to or from the needle or line of stitching, first loosening the screws which hold it to bed of machine and needle bar head. When the desired width is obtained be sure that all screws are tight.

To adjust needle with looper: When the needle bar is at its lowest point, and the looper is at its extreme backward throw, the point of the looper should be 5/16 of an inch from the needle, and in its forward throw should pass the back side of needle as closely as possible and not touch it, and in its backward throw the needle should just clear the back side of looper. The adjustment of this rocking motion of looper is by means of set screws in the looper rock shaft fork which secures it to the rock shaft. The lateral adjustment of the looper is by the connecting rod from lower arm of needle bar lever to the looper holder. After loosening the check nuts at each end of this rod, which has a right and left hand thread at the ends, a slight turn in one direction or the other will move the looper to or from the needle. The needle should be adjusted with the deep groove towards the operator, and of such a height that the eye will be about 3/32 of an inch below the looper when the latter's point is just back of the needle. In most cases this adjustment of needle and looper will insure the most favorable conditions for taking the loops of thread, but some unusual conditions of thread or fabric may require a slight modification, and this must then become a matter of the adjuster's own judgment.

Tensions.—In this machine the lower tension should be looser than the upper, but the proper adjustment of either one will be found to vary with the quality of fabric. That of a hard or non-elastic nature requires, and will stand, a tight tension, varying with the strength of the thread. In sewing on knit goods of an elastic nature, the trick is of course to produce a seam which will be strong and at

the same time just as elastic as the material itself, and it is obvious that the latter result cannot be obtained with too tight a tension. A good test to determine proper position of the tensions is to examine the seams after sewing; if the seam gaps or opens on pulling the two pieces of cloth apart the tension is not tight enough, and if on pulling it lengthwise of the seam the threads break the tension is not loose enough.

Take-up.—This part operates to take up the slack of, and cast off at the proper time, the lower or looper thread. The adjustment of the cast-off function will be found by raising or lowering the retaining wire, the points of which have their position in the central groove of the take-up.

To Adjust Nipper Springs.—These serve to hold the looper thread tighter than the tension discs will do at the time of setting the stitch; they should close and nip the thread just as the take-up comes up between the thread eyelets and touches the thread; again, when the looper has reached the end of its backward throw and is ready to come back, the nipper spring should be closed. If greater elasticity is desired, adjust the spring to nip a little later, by means of the adjusting screw in the lug directly underneath the free end of nipper spring. By raising or lowering this screw the nipper spring is made to nip the thread earlier or later, as desired. Both of these parts—take-up and nipper spring—are sensitive to a large degree, and should not be moved unless the adjuster is sure there is a reason for so doing. In "fixing" machines, it is well to bear in mind that certain parts perform their allotted functions. The fixer can always "get at the bottom of things" by studying the relation of the parts to the portion of the work they are designed to perform. The more he knows about these relations, the quicker will he locate the trouble, and the trouble once located is generally easily remedied.

MET.

Foreign Markets for Knit Goods.

Our export trade in cotton goods, which during recent years has grown so rapidly, and raised hopes of still greater things in the future, has been confined almost wholly to woven fabrics.

So far as the government's published statistics show, we export no knit goods. If we are to supply foreign markets with woven cotton goods, why not with cotton knit goods? The knit goods industry in the United States is as far advanced as cotton cloth manufacture, in respect to machinery, processes, knowledge and skill.

The reason is that we have not yet introduced our knit goods in foreign markets. The following tables showing to what countries England and Germany export knit goods, will be interesting. If we are to export knit goods, it will probably be to those countries which are now using English and German goods. The value of British exports are given in pounds sterling, while the German exports are reported by weight in units of 100 kilos (220 lbs.).

Exports of Cotton Hosiery from the United Kingdom to Foreign Countries.

Value in Pounds Sterling.

	1895.	1899.
Germany	£ 2,266	£10,523
United States of America,	25,423	10,845
Belgium	5,048	6,218
Other Foreign Countries..	12,568	9,855
Chile	26,121	7,297
Egypt	4,009	3,373
Argentine Republic	4,099	4,327
Brazil	11,734	3,857
Holland	1,899	2,101
Uruguay	2,653	2,536
China	1,275	2,989
Peru	1,544	2,263
French Possessions	1,019	1,409
Colombia	9,234	1,269
Denmark	1,044	1,202
Turkey (European)	4,561	1,033
Turkey (Asiatic)	1,311	1,349
Mexico	3,844	1,228
Venezuela	2,651	886
Russia	826	885
Spain	700	876
Japan	1,918	2,787
France	336	805
Nicaragua	1,658	716
Portugal	1,174	449
Costa Rica	1,814	549

Hayti and St. Domingo....	1,201	520
Honduras (not British) ...	232	372
Ecuador	631	338
Canary Islands	1,293	263
Portuguese Possessions....	754	173
E. African Possessions:		
Portuguese	410	170
Gautemala	1,293	55
	£136,523	£ 83,518

Exports of Cotton Hosiery from the United Kingdom to British Possessions.

Value in Pounds Sterling.

	1895.	1899.
British East Indies	£27,364	£29,916
Australasia	154,391	119,976
West Africa	7,606	16,437
Canada	20,756	16,671
British West Indies	19,188	9,270
Cape of Good Hope	26,614	22,592
British Honduras	3,754	1,592
Hong Kong	1,274	2,389
Malta and Gozo	1,513	1,427
Natal	3,446	5,767
British Guiana	3,670	1,874
Gibraltar	967	1,187
Bermudas	542	593
British West Africa	4,060	294
Other British Possessions..	365	379
Mauritius & Dependencies,	293	233
Newfoundland	815	194
Channel Islands	99	122
	£276,697	£230,913
Zanzibar and Pemba	119	
	£276,816	

Exports of Woolen and Worsted Hosiery from the United Kingdom to Foreign Countries.

Value in Pounds Sterling.

	1895.	1899.
United States of America,	£173,464	£62,269
Germany	34,027	28,066
France	61,299	25,252
Belgium	22,608	24,359
Denmark	13,721	19,420
Turkey (European)	11,352	9,592
Sweden	8,456	9,590
Other Foreign Countries..	10,000	9,358
Japan	5,777	7,950
Argentine Republic	4,374	4,578
Egypt	5,272	4,539
China	1,836	3,552
Italy	3,956	3,121
Spain	3,134	2,735
Norway	2,151	2,241
Chile	8,336	2,201
Turkey (Asiatic)	2,597	2,127
Holland	6,611	2,084
Uruguay	3,286	1,605
Russia	1,928	995
Brazil	3,172	410
Canary Islands	1,051	224
	£388,408	£226,268

Exports of Woolen and Worsted Hosiery from the United Kingdom to British Possessions.

Value in Pounds Sterling.

	1895.	1899.
Australasia	£186,464	£300,082
Canada	134,902	236,036
Cape of Good Hope	63,160	70,231
British East Indies	28,571	38,253
Natal	8,264	14,858
Channel Islands	3,647	5,998
Newfoundland	6,811	5,352
Other British Possessions,	3,259	3,378
British West Indies	4,645	3,121
Hong Kong	1,062	2,496
Malta and Gozo	1,110	1,174
British Guiana	1,069	1,143
British Honduras	1,515	968
	£444,459	£683,090

Exports from Germany of Cotton Hosiery in 1898.

Weight in units of 100 Kilos (220 lbs.).

United States	33,814
Great Britain	13,715
British East Indies	6,061
Holland	4,842
Brazil	4,330
Austria-Hungary	2,975
British Australasia	2,859
Turkey	2,852
Belgium	2,377
Argentine Republic	2,264
Chile	1,826
Roumania	1,592
Uruguay	1,547
Switzerland	1,401
Mexico	1,129
France	905
Egypt	883
Peru	874
British North America	850
China	833
Colombia	515
Russia	497
Dutch East Indies	475
Ecuador	433
British South Africa	379
Italy	358
Venezuela	297
Portugal	254
Sweden	252
Norway	239
British West Indies	167
Spain	156
Honduras, Nicaragua and Salvador,	150
Costa Rica	136
Philippine Islands	125
Total, 1898	92,362
Total, 1897	97,454
Value, Marks	51,961,000
Value, Dollars	12,366,718
Value, Marks	53,600,000
Value, Dollars	12,614,000

Exports from Germany of Woolen Hosiery in 1898.

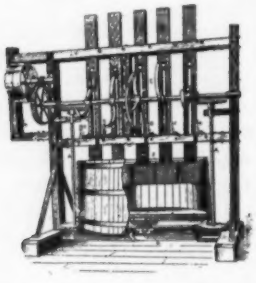
Weight in units of 100 Kilos (220 lbs.).

Great Britain	10,453
Holland	3,825
Turkey	2,443
United States	1,731
Switzerland	1,572
Belgium	1,030
France	629
Russia	601
British North America	521
Sweden	506
Norway	500
Austria-Hungary	474
Brazil	458
British East Indies	434
Roumania	373
British South Africa	298
Denmark	290
Argentine	246
Mexico	243
British Australasia	213

Japan	206
Finland	185
Chile	149
Italy	98
Portugal	89
Bulgaria	65
Free port of Hamburg	55
	27,687

An Improved Tom-Tom.

The Tom-Tom built by Frank's Wagon Works, 2731 North Sixth St., Philadelphia, for dye houses, woolen and knitting mills, has met with success wherever used. The jar and shock which such a machine is subjected to, necessitates a solid construction, and this point has been very carefully looked after. All parts are very substantial, and an extra brace



has been placed in the center of the frame to steady the main shaft.

The excellent principle of driving the machine with a small, fast running belt, and from this gearing down to the slowly revolving tub, has been followed, and in addition the gearing has been placed on each side. This gives a uniform motion to the machine, besides relieving the gears, belts and pulleys of any excessive strain or wear.

The center bearing of the tub can be oiled as easily as any of the outside ones. By giving the oil cup a turn, the oil is forced through a pipe into the center bearing.

The cams are so arranged as to cause the outside plungers to fall twice while the center one plunges once. This results in giving the goods both on the outside and on the center of tub, the same work.

A lid is provided which prevents the splashing of the liquid. The plungers are provided with plates to prevent wearing, and the tub turns on large castor rollers when revolving.

The best material is used in the construction of these machines. They are made with four or more plungers as desired. A five plunger machine, such as we illustrate, will dye or wash 250 pounds of goods in one operation.

This Tom-Tom is now in use by the Franklinville Dye Works, Brown Bros. & Alberle, Thomas McCawley, and the Continental Dye Works, Philadelphia and others. This company also builds oxidizing and chroming machines for fast black dyeing.

On Shaping Circular Fabrics.

J. HENRY QUILTER.

There is no more interesting subject in connection with the art of framework knitting at the present time than that of shaping a circular fabric. This subject has been brought especially to the front through the development of the circular knitting machine, which enables a stocking to be made upon the one machine, with heel, foot and toe complete, the foot being like the leg, seamless.

Taking first a ladies' plain hose made on such a machine, two facts at once appear to the practical man: 1st, that if the fabric is made of the same quality throughout, the same number of needle loops being made at each revolution, the fabric will retain the same circumference; 2d, that a variation of the circumference of such fabric can only be overcome by one of two principles, viz., the reduction in the number of loops or the reduction in the size of such loops. At the present time it has been successfully accomplished only by the latter method, the reduction of the size of the loops, so that there still remains the fact that a fashioned leg gives the more accurate shape, when it has the number of its loops gradually reduced the required number of

needles, which as a guide in the case of the leg of women's plain hose equal one-fifth of the whole width.

The problem has yet to be solved as to how to reduce the needles of a circular frame so that any varying number from four-fifths to the whole may be removed out of action without any depreciable effect on the fabric except that of reducing the number of loops. The hat knitting machine is of such principle that a shaped circular fabric can be made on these machines by actually reducing the number of needles in action at the various courses, and such legs are now being made, the foot being added on a circular knitting machine; but here the question of two machines alters entirely the question at issue of shaping fabrics on circular machines.

Another problem that comes to the practical mind is how to dispose of the needle loops could the needles at a given course be dispensed with; for every one who understands the structure of a knitted fabric knows that any loop must be supported or it will release in turn the loop it supports. This fact has led to the necessity of hanging such loops on to other needles should their original needles be taken out of action. On straight bar frames the loops are actually taken from the needle, removed sideways and replaced on to the adjoining needle, though another system is in vogue on spring needle circular frames of removing the loop from one needle to another by the special positions of the needles at various parts of the formation of a row of loops.

Which, then, is to be the principle to be adopted with regard to circular knitting machines of the latch needle type?

The question of removing loops from one needle to another on circular machines brings us at once to the circular rib knitting machine; here what was once a difficult problem bids fair in the near future to be an accomplished fact, viz., the removal of a loop from one needle to another when the two needles are opposite to each other. Note that the difficulty previously mentioned is not yet overcome. Loops may be shifted from one needle to another opposite and so at any course a rib loop may become a frame loop, or vice versa, but to reduce the number of loops in a circular fabric the number of needles must be decreased and the loop from any such needle, as may be taken out of action, must be secured by hanging upon the adjoining needle, or some other method.

What other method? I hear the reader say. That is a question I am not prepared to answer, or I might put the knowledge to overcoming a difficulty that once overcome may revolutionize the trade, and prove of great profit to the first successful solver of the problem. To assist in the solution of this important problem, let us first see what are the methods that have to be observed by hand, and the effect produced by such methods on the fabric, and this understood, then the way may be paved for the more important problem of how to produce similar effects by automatic mechanical movements, the same to be such that the capabilities of the machine producing them must not be crippled too much in its productive powers.

Any machine to be successful at the present day must be such that its mechanical movements can be readily understood, easily adjusted, not too costly, and at the same time be sufficiently productive to compete with any known method, and the advantage be on the side of the improvement irrespective of the fact of its being mechanical.

The best example of a ribbed article, that can be taken for an illustration as made upon a circular rib knitting machine, is without doubt that of a 2/1 ribbed hose. If such a stocking were commenced on 48/2 and 1 rib, the machine to produce same would require 96 needle spaces in the cylinder for needles to produce the plain

loops, and 48 needle spaces in the dial, these working in a position between each two cylinder needles, making in all 144 needles round the machine, producing an equal number of loops, viz., 96 frame and 48 rib, or a 48/2 and 1 rib fabric; this number is reduced in the ankle to 121 needles by a portion of the 2/1 rib being reduced to 1/1 rib by the taking out of action of 23 cylinder needles, and the fabric being this number of loops narrower, the 23 needles being out of knitting action, and the loops secured from running by being put upon the adjoining needles, the loops being shifted at certain intervals, and in a certain distance to give a proper shaping to the leg.

Fig. 2 illustrates the principle of this system; here are shown at A, 5 ribs of 2/1 fabric being alternate two cylinder and one ribbed needle wale. These at B have been reduced to 5 ribs of 1/1 fabric. At A were 14 needle loops; at B are 9 only, or a reduction of 5 cylinder loops, one from each two; thus the number of the loops have been actually reduced in number. The technical difficulty is first at S, where loops 7 and 8 are reduced to one loop 5, the two loops having been transferred by a sideway movement to one needle. At 2, two similar reductions are made, at 2A and 2B, and again at 3A and 3B, thus taking in 5 ribs, 5 needles out of action.

In making these changes by hand, the loops are shifted from one needle and replaced on to the adjoining one, and it still remains a problem how to effect this change automatically. Quite a number of principles have been adopted for producing the effect of Fig. 1, or the changing of a loop from a rib to plain loop, or vice versa, in order to make 1/1, 3/1 or plain fabrics upon the same machine, the number of needles always being the same.

Fig. 2 illustrates a change from plain to 1/1 rib. At A are shown 9 cylinder needles, which at B are changed to 5 cylinder and 4 rib needles, and may be reversed at any course required. In a machine with a flat dial the needles themselves must be changed, and the loops taken from one needle to another. Three principles have been adopted for this changing of the loop; 1st, by the use of a transferrer which takes the loop from one needle and holds it in position to deliver to the other needle, as it comes in action; 2d, by the needle taking the loop from the opposite needle without the aid of transferrers, but

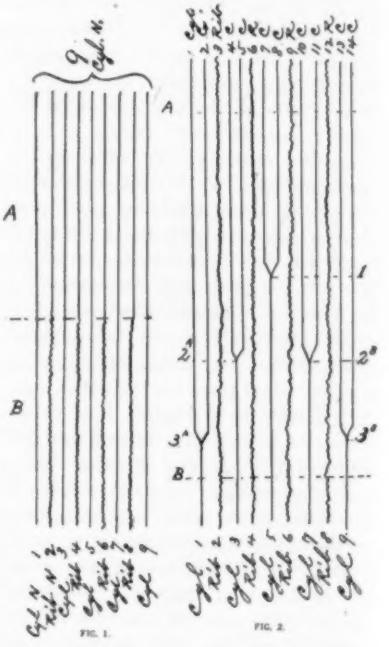


FIG. 1. FIG. 2.

by a peculiarly constructed needle which enters the loop direct, or allows of the loop being so opened as to allow the opposite needle to pass in under the loop, and so take it as the former needle retires; 3d, by the use of double ended needles, which may be used as cylinder or dial needles as required. To the writer this seems the only successful method, at least for the production of fine fabrics, but it yet remains for machines on this market to be thoroughly tested.

SILK DEPARTMENT.

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

Degumming and Bleaching Silk.

These processes are to a large extent involved together, for degumming is an essential preliminary to bleaching. Scoured silk may be divided into three great classes: "boiled-off" silk, "souple" silk, and "ecru" silk. The difference between the three lies in the fact that the bleaching is accompanied by the removal of different amounts of the gum or sericin which constitutes about 30 per cent. of ordinary silk-worm silk (from Bombyx mori), but only about 20 per cent. of Tussah or wild silk (from the caterpillars of other moths, not belonging to the genus Bombyx).

In ordinary silk, the coloring matter is not in the fibre, but is combined with the gum or sericin only, while in Tussah silk it permeates the entire fibre. Thus, as will presently appear, the bleaching of Tussah silk is quite a different and a much more difficult operation (although the introduction of peroxide of hydrogen has smoothed down the special difficulties to a large extent), compared with that of destroying the color matter of the silk of Bombyx mori.

In boiled-off silk the whole of the sericin, or at least as much as possible of it, has been removed, but in souple and ecru silks much of it is intentionally left behind. For souple silk only about one-sixteenth of the gum has been removed, and from ecru only as little as possible has been washed out. As it is impossible to bleach silk without giving it preliminary soap baths, and as sericin is soluble in hot water, it will be quite evident that the removal of at least some of the gum is unavoidable, and the great difference in the three methods of treatment for boiled-off, souple, and ecru silk respectively consists in the soap treatment.

For the first, when there is no idea of leaving in any gum at all, strong and nearly boiling soap solutions are used, and repeated, while for souple silks weaker baths at lower temperatures are employed, and for ecru silks, the strength, duration and temperature of the soap baths are brought down to the lowest possible point consistent with the success of the subsequent bleaching operations.

In all the following operations, says G. Alexander in the Hosiery Trade Journal, it is of the greatest importance that only soft water should be used. If, then, only hard water is naturally available, it must be first softened with carbonate of soda, or better, with ammonia, which does not give the bath a permanent alkaline reaction. If, too, the silk is to be dyed a light shade, it is essential that the soap used for removing the gum should be of the best quality of olive or cocoanut oil soap, and be absolutely without color. In treating weighted silk, the metallic oxides must be first of all removed with hydrochloric acid, diluted with its own volume of water. This treatment also facilitates the subsequent soaping by removing dirt and portions of the gum.

Boiling off silk consists in giving a series of soap-baths at a nearly boiling temperature, beginning with one containing about three pounds of soap and four gallons of water to every 10 pounds of silk. The silk is hung over wooden rods in the soap, which is heated up by a steam-coil, and left in for about three-quarters of an hour. The second bath lasts about the same time, but only contains from 10 to 15 per cent. of soap, reckoned on the weight of the silk. The "boiled off liquors" are often used for making up dye baths for the subsequent coloring of the silk, but it would be better to

recover the soap by precipitating the liquors with lime-water, and having decomposed the precipitated lime soaps with sulphuric acid, to saponify the fatty acids set free with caustic soda.

For souple silk only one stripping or soap bath is used, of 10 per cent. strength, and at a temperature below 100 deg. F. For ecru no soap is used at all.

The bleaching is largely done by means of sulphurous acid. This reducing agent is applied either in stoves in the form of gas produced by burning brimstone, or by immersing the silk in a bath of an alkaline solution of a sulphite or bisulphite, and then setting free the sulphur dioxide by adding a mineral acid. Sulphur bleaching is unsatisfactory on account of the tendency of the yellow color to recur when the silk is washed. Peroxide of hydrogen is much to be preferred, and is perfectly simple in its action. About 2 gallons of the peroxide (10-volume strength) are used for every 10 lb. of silk, in 40 or 50 gallons of water made alkaline with a little ammonia or borax . The bath should be heated for an hour or two after the first twenty-four hours.

Souple silk is often bleached with aqua regia. A mixture is made of nitric acid and five times its weight of hydrochloric acid. After this mixture has stood for a day or two it is brought to a strength of about 3 deg. B. with fifteen times its volume of water. Care must be taken that the silk does not remain too long in this bath, or it will probably turn back to yellow again, and the mischief is irremediable. As soon as the silk has a slight greenish grey tint, it should be thoroughly rinsed. The last process with souple silk is to restore the feel, which is now hard and stiff. For this purpose a cream of tartar bath is prepared containing 3 lb. of the salt in 80 gallons, and the soap is boiled in it for from an hour to an hour and a half, or the silk may be treated at 75 deg. C. for one or two hours in a bath of 10 per cent. sulphuric acid of 66 deg. B., half per cent. of sulphurous acid, and 2 per cent. of sulphate of magnesia.

Tinting (i. e., correcting the yellow) with violet is sometimes substituted for bleaching.

Tussah silk is the product of caterpillars, not of the germs Bombyx, and, as already mentioned, is very difficult to bleach on account of the coloring matter being in the fibre. Besides, the lime in Tussah silk has a prejudicial effect on the boiling-off process. Two processes can be employed for degumming and bleaching—one is to first remove the lime with dilute hydrochloric acid (1 in 8), which also removes the dirt and gum in part, then to give a soap bath containing 10 to 15 per cent. of soap, and then a bath for 24 hours of the clear liquid got by mixing bleaching powder and solution of carbonate of ammonia, and decanting. This bath should be about 7 deg. B. Then treat with hydrochloric acid of 1.5 deg. B. for 20 or 30 minutes, rinse, and finish the bleaching with peroxide of hydrogen and 8 per cent. of water-glass used cold.

Koechlin gives another process which consists in boiling for a few hours in a bath composed of 100 litres of water, 10 kg. of caustic soda, 30 kg. of soap, 5 kg. of 10-volume peroxide of hydrogen, and a little ammonia.

It must always be remembered that perfect bleaching is not required for silks which are to be dyed dark shades, as the dark dyes entirely swamp any scarlet ground color which may remain.

A Manufacturer Talks About "Tabby Cloth."

Not having seen my friend, the silk manufacturer for over two weeks, I decided to call and try to get some new ideas, or some old ones rehabilitated. It was Monday morning, and I supposed, that having had a day's rest and listened to one or two good sermons, he would be in a peaceful communicative mood; but instead of giving his usual response to my

cheery good morning, he gave his head a jerk, and me a look which seemed to say: "I'd like to know what you want here?"

While I was in doubt whether to go out, or sit down and wait an explanation, he said: "So you have been trying to give one of my patterns away?"

"Have I?"

"Have I? You know you have, and a nice mess you made of it."

"Well, admitting what you say is correct, may I ask what's the matter with it?"

"Matter," and he had a laughing fit. Not wishing to interrupt what seemed to give so much pleasure, I went over to the desk and took up the last number of the Textile World and turned to the Silk Department, then he stopped.

"Well, are you going to be kind enough to explain that 'nice mess'?"

"In the first place you treat Japan and Tussah as if they were the same heft, while Tussah is about 2½ times as course as Japan; the cross section of Japan being about 1/2000 inch, Tussah, about 1/770 inch."

"Hasn't there ever been any Japan with a cross section of 1/700 inch?"

"There may have been, and there have been sheep with two heads, but they were not average sheep, and silk manufacturers deal with averages. Suppose I ordered yarn according to your figures, what would happen? Before warp was half made, brown yarn would be done, warper wait till I ordered more and got it thrown, dyed, and spooled; the same with the filling, and if dyer didn't get shade, piece would be spoiled, and I would have to begin all over again." He went out to shipping room and returned with a piece of the goods.

"Here is a fair sample of tabby cloth, but if made according to your directions, it would look more like a repp or a gros grain, the dull lustre of the Tussah would stare through the brighter Japan, and might even show through the brown stripe, and that would look more like a piece of melton overcoating than soft silk dress goods."

"Is that all?"

"Isn't it enough? And yet it isn't all. Had warp been made by your directions, the ½-inch stripe on each side of piece wouldn't be ½ inch, you should have added 10 threads to each side of warp."

"I supposed any textile man would know that."

"You are not supposed to suppose anything. When you undertake to give instructions how to do anything they should be full. What made you think I had brown warp entered 4 and 3 alternately, in space reed?"

"It is a different weave and I didn't think the coarser yarn would keep brown warp tention equal to the blue."

"Brown was entered in 4s. same as blue, and warper put ½ oz. washers on spool pins over brown warp spools to increase tension."

"Since you have been so kind as to show me how little I know, wont you please give particulars of how you made the goods?"

As I had been so meek, he couldn't very well refuse, and being a quick penman soon had particulars on a piece of paper which he handed to me. Looking at it I said: "You have only 5 baves in brown warp; the thread I examined seemed to have 12."

"Don't you know why? In thread you examined there may have been 6 baves, 2 or 3 cocoons being nearly run out in reeling, another one may have been added to keep thread uniform, and as Tussah bave is more of a ribbon form than Japan, and in boiling off and dyeing, nearly always splits into the 2 filaments of which it is composed, care must be taken to see whether the bave be split or not, and calculate accordingly. You state hard silk loses about 3/10 in boiling off, ¼ is nearer the mark, and 300 yds. of Japan, is nearer what will balance 1 grain, than 290 yds. and about 120 yds. of Tussah weigh 1 grain. Except in analyzing a sample to find whether it be weighted or not,

in calculations, it is not necessary to distinguish between hard and soft silk, because soft silk takes up about as much in dyeing as it loses in boiling off, pure white excepted."

Here is my transcription of his particulars: Warp, two, 10 bave threads, dark blue Japan, 10 twists to inch, and two, 5 bave, light brown Tussah, 15 twists to inch. Filling, one 6 bave thread, dark blue Tussah, 6 twists to inch. Warp in 4 by 4 inch sample contains: 3½ inches, dark blue Japan, 112 threads to inch. ½ in. light brown Tussah, 112 to inch. Filling, 4 in. dark blue Tussah, 112 to inch. Then, $(4 \times 3\frac{1}{2} \times 112 \times 20) \div (36 \times 300) = 2.9$ grains, = weight of Japan warp in sample, and $[(4 \times 4 \times 10 \times 14) + (4 \times 4 \times 6 \times 112)] \div (36 \times 120) = 3$ grains, weight of Tussah in warp and filling. Sample weighs 6 grains.

In 1 yard of cloth there are: 25 blue stripes, 112 threads each = 2800 yards + 20 yards = 2820 yards warp. 25 brown stripes, 14 threads each, = 350 yards warp. Then, $[(2820 \times 20) \div 300] \times (1000 \div 7000) \times [(10 \times 10) \div (9 \times 9)] = 33.1$ pounds = Japan warp required for 1000 yards, and $[(350 \times 10) \div 120] \times (1 \div 7) \times (100 \div 81) = 5.15$ Tussah, and $[(3136 \times 6) \div 120] \times (1 \div 7) \times (100 \div 81) = 27.65$ filling.

If an equal length of soft silk dyed, weighs the same as equal length of hard silk, and 16 square inches weigh 6 grains, then: $[(36 \times 28 \times 6) \div 16] \times (1 \div 7) \times (100 \div 81) = 66.66$ pounds = whole weight of hard silk needed for 1000 yards. He ordered 33.5 pounds Japan, 5.25 pounds Tussah, 5 bave, 28.25 pounds Tussah, 6 bave.

Seeing a piece of a pattern I had not seen before, I asked if he had any looms on it.

"Why, do you want to crib that too?"

"It seems to be one likely to sell."

"I am on a 50,000 yard order and it may be duplicated. Go ahead, if you think you can do anything with it, but don't ask my help. I don't think anyone will care to follow your directions again after trying once."

I found it a 28-inch tabby, same material as the other, but differently arranged. It is a solid color check, warp 1 inch of two 10 bave threads of Japan, and 1 inch of two 4 bave Tussah: Japan 10, Tussah 15 twists to the inch. Warp begins and ends with 56 threads of Tussah, is woven from 1 warp beam, entered on 6 shafts, 1, 3, 5: 2, 4, 6: 1, 4 and 5, are raised together, then 2, 3 and 6. This is usual tabby draft.

It is entered in 56 reed, 2 ends in a dent. A selvage spool of 8 threads of two 3 bave Tussah, 20 twists to inch, is added to each selvage, to prevent them from being zigzaged by the 2 kinds of filling. These threads should be drawn double on 2 shafts, and if a separate motion can be had, woven 2 picks in a shed, shed crossing at side shuttle picks from. Filling is one 16 bave Japan, thread 2 twists to inch, and one 6 bave Tussah, 6 twists to inch. Color for warp and filling, medium shade violet, 112 picks to inch. Amount required for 1020 yards of warp: $= [(1568 \times 20) \div 300] \times (102 \div 700) \times (100 \div 81) = 18.8$ pounds Japan: $[(1568 \times 8) \div 120] \times (102 \div 700) \times (100 \div 81) = 18.8$ pounds Tussah. Filling: $[(28 \times 112 \times 16) \div (300 \times 2)] \times (102 \div 700) \times (100 \div 81) = 15.04$ pounds Japan: $[(28 \times 112 \times 6) \div (120 \times 2)] \times (102 \div 700) \times (100 \div 81) = 14.1$ pounds Tussah.

Had I asked my friend to look at my work, he might have thought I wanted some help, and I wasn't in a mood for asking help just then, so putting the paper in my pocket, tendered my thanks and took my leave.

OLD CONTRIBUTOR.

Calculation of Silk Goods.

LUDWIG BRAUN.

When we speak, in the following article, of calculation, we refer only to the theoretical or raw calculation. As in many factories, besides the theoretical, there is also a practical calculation; we will first refer briefly to the latter. By the practical calculation, as is well known, every piece manufactured in the mill is

calculated by itself. If then we compare the prices of a series of pieces of the same article, we get the average price of the fabric, by which we can sometimes modify the result of the theoretical calculation.

Every theoretical calculation is more or less guess work; even in plain goods there are a great many articles in the price of which considerable alterations occur. Of this we will give a few examples.

About three years ago a new article, called "Moire Velours," was introduced. By this name is not to be understood a velvet fabric, but a simple taffetas-weaving, which is watered later on. The warp is silk; the weft was at first mostly wool. Every expert knows that wool shrinks after dyeing, and in the theoretical calculation, we had reckoned this shrinkage at about 12½ per cent., but the first pieces coming from the looms showed a shrinkage of 22 to 24 per cent., nearly double what we had calculated.

This result is the more remarkable, as we had formerly manufactured Bengaline, the warp of which is also silk and the weft wool. In this fabric the shrinkage was only 5-6 per cent. We therefore thought that it would be enough to allow for double this amount in the "Moire velours." But the practical calculation showed us that we had reckoned this article 6d per yard too cheap. This important difference is due, in the first place, to the varying thickness and the shrinkage of the wool yarn.

A comparison of the theoretical with the practical calculation will generally show us that the former has been too low. The reason for this may be found in the methods by which the practical calculation in the factory is made. Nearly every factory has a different method: the chief differences resulting from the weight of the weft, and from the length of the piece. The first condition for an accurate practical calculation is accuracy in the weaving book.

In all silk fabrics the weft is of great importance, because it usually calls for the greatest outlay: nevertheless, in the calculation of the weft less care is generally taken than with the warp. Not rarely the weight of the weft is reckoned by subtracting the weight of the warp from that of the whole piece. By this method it is impossible to arrive at an exact estimate of loss of the weft: we calculate only the weight of the filling which the piece contains, but not the loss which the weaving brings about.

In order to reconcile the practical with the theoretical calculation, we must first make the inquiry: Does the rate of loss in the theoretical calculation agree with that in the practical? This question may, with regard to the warp, be answered in the affirmative, taking for instance 5 per cent. in both cases. The same, however, does not apply to the weft. If in the theoretical calculation of the weight of the filling in, we have reckoned a loss of 10 per cent, this would mean that, taking the same rate in the practical calculation, 10 per cent. will be enough. This, however, is not the case.

In the calculation of the piece coming from the loom we take that filling-weight which the weaver has really used. In other words, we calculate once more the loss brought about by the weaving, because already in the calculation of the different portions, we have allowed, for winding, spooling and weaving, a loss of 10 per cent. It is obvious that in this manner will arise, especially in all silk pieces which contain much weft, a fairly important difference.

In order to find the true solution, we must reckon in the theoretical calculation 15 per cent. loss as regards the weft (the usual 10 per cent. is in many cases too little), and on the other hand we reckon on the calculation of the portions only 5 per cent. as loss, produced by winding.

The principal loss of weft is produced by the weaver in spooling and working: only by reckoning the weight

which the weaver has really consumed, can we calculate without hesitation the correct weight. This principal loss amounts on the average to 10 per cent. If we balance every single piece, we can easily determine the loss made by the weaver, and if we put together a series of these pieces, we have a sure guide to the weight of the filling in the whole.

In colored pieces, this result is easily obtained, because the weft is then dyed specially for every separate piece, or for several pieces, at most, of the same colors. If in such a case the weaver does not find the weft supplied to him sufficient, either he has shot in too many picks, or he has made too much loss in weaving. If on the other hand he has some weft remaining, he has shot in too few picks, and the fabric is of inferior value.

As regards black colors, no such control is possible, as in colored pieces: because the dyeing is done for many pieces together. In order to obtain an exact control for black pieces, we must set up a book in which the black parts are entered in progressive numbers of date and weight as they come from the dyeing on the left-hand side. On the right side is entered that portion which the weaver consumes. As soon as a piece of black goods is woven, the consumed weight of weft is entered in this book, together with the number of the piece. So we have always at hand a summary of what is stock from the respective parts. The small amount of trouble which the keeping of such a book entails is fully compensated for by the increased surety with which we work. In the same manner we can enter a control for the material of warp.

To turn to the theoretical or raw calculation, there are many different methods, all with the same purpose. The manufacturer must take care to choose such a method as is most practical, and in which the employment of few figures is necessary. It is much to be hoped that a uniform number for the different yarns will soon be introduced. Unfortunately, we have to employ, at the present time, a special method of numeration for each material; in raw silk, for instance, there are no less than five different systems of numeration. For our calculations we consider only the old size of Turin, that is to say, a thread of one denier, and a length of 476 metres, weights 0.0533 grams.

There is, besides this, another kind of numeration, called the International size, that is to say a thread of one denier in a length of 500 metres weights 1/20 gram, consequently one gram contains 10,000 metres. From this number, we have to subtract the loss per cent. and to divide the result by the size of the correspondent silk. We thus get the number of metres per gram. For instance 10,000 metres—5% loss (= 500) gives us 9500. If we have, for example, 20 deniers organzin, we divide by 20, and get 475 metres per gram as the result. If we want to know how many grams of raw organzin, of 20 deniers internationals, are necessary for a warp of 8000 threads, loss 5%, and length 100 metres; we must employ the following formula $(8000 \times 100) \div 475 = 1684$ gr.

For the size of Turin this formula would be expressed in the following manner. A thread of 1 denier, and length 476 metres weights 0.0533 grams. Consequently one gram contains $1 \div 0.0533 = 18.762$ deniers; therefore one gram $= 18.762 \times 476 =$ 8931 metres. From this number we have to subtract the loss %, and obtain the number of metres per 1 gram which we must enter in the calculation. Therefore, 8931, with 5% loss gives us 8484 metres. For instance if we inquire how many grams of raw organzin of 20 deniers Turin are necessary for a warp of 8000 threads, 5% loss, and length 100 metres, we have to enter the following formula $(8000 \times 100 \times 20) \div 8484 =$ a result of 1,886 k. g.

(To be continued.)

POWER DEPARTMENT.

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

ELECTRICITY—STEAM—WATER.

Friction Clutches.

RICHARD H. HILL, M. E., Boston, Mass.

Abstract of a paper read before the meeting of the New England Cotton Manufacturers' Association, at Washington, D. C.

In presenting this paper to this Association, it is not with the object of bringing to its attention any particular make of friction clutch, the article being a simple statement of facts that have come under my observation during the past twenty-five years' experience as a patentee, manufacturer and engineer in this particular line. I trust the data herein given may be of some practical value to any of you who may be interested; and every manufacturer should be interested in a good friction clutch properly installed and constructed for the duty required of it, for the simple reasons that it is a good investment and a great convenience.

I am frank to state, however, that I have met a number of manufacturers who have been interested in friction clutches to their sorrow; in fact there may be some gentlemen before me today who have been through this experience and firmly believe no good can come out of Clutch-land.

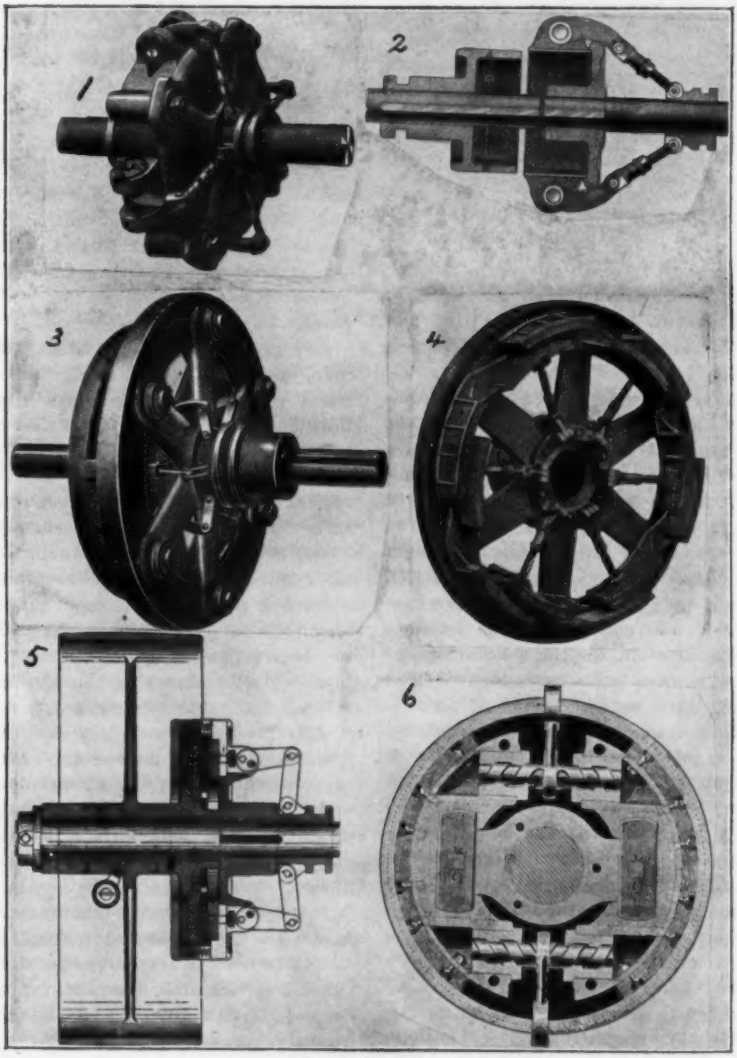
They may tell you a friction clutch is a useless expenditure; they positively know it, have been there. Allow me to tell you how, in all probability, they got there. We will assume that the manufacturer is an alert, energetic business man, always on the lookout for anything that will reduce the cost of his production. He learns that his neighboring manufacturer has introduced a system of friction clutches in his mill which has proven very satisfactory, there being quite a saving of coal and wear and tear of machinery. He learns that each room in his neighbor's mill is controlled by a friction clutch, by means of which the machinery in any one of the rooms can be stopped without shutting down the entire mill. He sees his way clear to run certain departments overtime, to get out rush orders without running the entire plant.

Getting confidential with his foremen, he remarks, "I really believe those two old couplings down stairs have cost us the price of that new engine and water wheel we want so badly. Why didn't we get at this clutch business before, and to think those fellows over the way should get ahead of us. One thing though, they don't know how to buy over there. The agent put the whole outfit into an engineer's hands, giving him full swing to put in whatever he thought best. I was talking with one of the directors of their mill the other night, who said it cost them a pretty penny. Now, Tom, I want you to see their boss carder, find out how the trick is done, and I will buy the clutches. Our machinist will fit them up and we will show those fellows how to save money."

This is just where the manufacturer made a big mistake and when "friction clutches" are mentioned within earshot of him, it is like raising a red banner before a bull. Had he done as his neighbor, called in the services of some honest fellow who was competent to advise him as to his particular wants, he would have been just as contented with life as his neighbor and would have thought a friction clutch was blessed instead of, well, otherwise, as he now does.

A few hints as to the most desirable construction in a friction clutch, for

the duty required of it, may not be amiss. The most extensively manufactured friction clutches today can be divided into four classes. These, which we can designate classes A, B, C and D respectively, are illustrated in the accompanying sketches.



FIG'S 1 AND 2 SHOW CLASS A CLUTCH.
" 3 " 4 " " B "
" 5 " " C "
" 6 " " D "

Class A clutches are what are known to the trade as "Band" or "Hub" clutches. Of this type there are a variety of makes. A drum or hub forms one part, which is surrounded by a band or brake strap held in position by the other part of clutch. The tightening or loosening of this brake or band by levers or screws, connects and disconnects the two parts of the clutch, the frictional surfaces being between the inside of brake or band and the outside of the hub or drum. This clutch, if properly constructed and proportioned, can be

made to swing in a very small diameter and yet be exceedingly powerful, but it requires considerable room on the shaft. The shaft should be made heavy for overhang. The clearance between the frictional surfaces necessarily being limited, it is necessary to withdraw the drum or hub from under the clamp or brake to avoid the rubbing or chafing of the frictional surfaces. It has been found that clutches of this description give the best results by using metal surfaces, having the frictional surfaces well lubricated when picking up the load. They are well adapted to places requiring a large amount of power at moderate speed, and also to cut out long lines, the sliding drum taking the place of an expansion coupling.

Class B clutches are known to the trade as the "Rim" type. A ring of considerable diameter, finished upon the inside and outside, having arms and a hub similar to a pulley, forms one part of the clutch. The other half of the clutch is provided with jaws shod with wood which either swing on a pivot or by sliding in guides grip the ring on both sides. It is usage in this clutch to use large diameters in order to get the necessary leverage to transmit the required power, and as the friction surfaces are keyed under each other, a greater clearance has to be allowed. This clutch can be so constructed as to take up very little room on the shaft, which is a very desirable feature for some situations. They do not require quite so careful mechanical attention as the hub type, and should the friction surfaces give out, they can be renewed quite easily while the clutch is in position, it not being necessary to take it to a machine shop for the repairs.

The two foregoing types of clutches, while they can be used as clutches for friction pulleys, are beyond doubt best adapted for friction clutch cut-off couplings, connecting two shafts. The freedom of end movement which all good running shafts should have and the expansion and contraction of the shafts caused by changes in temperature, will not affect them. This is particularly true of the Class A construction.

Class C clutches are known as the "Disc" type. In this clutch the frictional surfaces are at an angle to the shaft, not parallel, as in the case of Class A and Class B. Some makers, however, shoe these surfaces with wooden blocks, having loose fit in the head, which makes the clutch elastic. Where this is not done, or some similar provision made and metal frictional surfaces are used, it being difficult to oil said surfaces, there is a liability that clutch will heat when one part is running and the other part is idle. This is particularly true where it is used as a friction cut-off coupling to connect and disconnect shafts.

The end movement of the shafts has a tendency to bring the frictional surfaces into contact, causing abrasion and a tendency to heat. These clutches are best adapted for friction pulleys to be used on counters, the springs used to separate the frictional surfaces when thrown out generally keeping these surfaces separated, as they have a limited body to move. As a rule, these clutches can be made for less money than other types and under the proper conditions can be used with good results.

Class D clutches are known as "Expanding" type, sometimes nicknamed "Hat Stretcher." This type and the old pan friction clutch are among the old types known and some of them have been developed to a point where good results can be obtained from them. One of the objections to them is their heavy weight. If the friction slips, the outside part heats and enlarges and will continue to slip more and more. I have in mind a plant where this style of clutches was installed, the clutches being a little too small for the duty required of them. When the load came on heavy during a part of the day, and the clutches began to slip, the engineer would turn water on them, cool down the outside and in this manner would get through his run. Where the simple pan clutch

is used, the end thrust is quite an item to be considered, and there is a liability of the frictional surfaces sticking.

In this brief article, it would be impossible to touch upon all the different classes of clutches. There are hydraulic and pneumatic frictions, many of which, from the theoretical point of view, have claims of excellence, but after all is said and done, to construct a good efficient friction clutch of any class requires a great deal of patience of the cut and try order until the parts are so constructed and balanced that the clutch will back up the principle involved and when put on the market it will not be a source of annoyance on account of the weakness of some apparently unimportant part.

I would advise that when you get your clutch, be sure it is fitted by a careful and exact machinist who is well acquainted with the clutch in hand. Provide solid, substantial foundations, and in the case of large friction cut off clutches, use a connecting bed plate for the bearings on each side of it, and when it is erected, be sure the shafts are in perfect alignment and that they will be held there.

The growth of the friction clutch industry has, like many other good things, been phenomenal. It is my firm belief that there has been manufactured and put upon the market a larger value and greater number of friction clutches in a single day in this year, 1900, than was produced in the whole year of 1875.

The general introduction and use of electricity has been largely responsible for the increased demand for first class friction clutches. The high speeds at which they are invariably run in electrical generating plants, and the extremely severe duty required of them for this class of work, has brought out the best efforts of our mechanics in producing satisfactory running clutches. It has been one of the best advertising mediums of the friction clutch business, and has, in many instances, shown to inquiring minds the advantage of the adoption of friction clutches in other channels of work.

It is an accepted fact that no first class builder of machine tools, or of any other machines that need to be stopped and started frequently, does not find it to his advantage, as well as to his customer's, to use friction clutches to operate the said tools or machinery. Compare the ordinary engine lathe, built on modern lines, having a good friction clutch pulley countershaft, with that old annoying arrangement having a jaw-clutch pulley countershaft. The slam-bang noise of one of these pests when in use in a shop is enough to put the men's nerves on edge, to say nothing of the hard labor and skill necessary to operate it and the liability of spoiling the work in hand. The trials of operating one of these old jaw-clutch devices is enough to make one want to send the fellow who had nerve enough to make it, to the place where St. Peter sent the man who gave him lessons on the bicycle.

Go a step further and compare the modern friction clutch pulley countershaft with the old tight and loose pulley affair with its shifting, sluggish, squealing belt, which is continually wearing out and breaking down. Note the ease with which the operator controls the machine having the friction clutch device. He can do more work, better work, with less exertion and less wear and tear on the machine and belts. Yet it is not such a long time since the manufacturer, and even the operator, thought the old jaw-clutch or tight and loose pulley device on a lathe was pretty good. The fact is, they did not know of anything better.

It is human nature to judge by comparisons, and the enlightenment in the use of friction clutch devices, their advantages on a lathe counter or any other machine, is the reason of the ever increasing demand for the many thousands of friction clutches manufactured annually and the enormous increase in the number of willing buyers.

The Fan Factor in Steam Economy.

A. W. BAYARD.

The chimney has long been the commonly accepted agent for supplying to the fuel on the grates of steam boilers that amount of oxygen which is demanded for combustion. When we come to examine into the conditions governing draft production, we discover what an excessively wasteful contrivance the chimney is. For years and years it has served its purpose after a fashion, and even today it were folly to say that the huge tube had outlived its usefulness.

However, the rapidly altering conditions of modern industry are productive of many radical changes in methods and processes. Rapidity is now the order of things, and economy is a vital consideration. As a result of these economic forces the mechanical draft fan entered the field against the chimney. It has won its spurs over and over again, and more than that, it can well be said that before a great while, of making of chimneys there will be an end. Before attempting to bring out the many advantages of mechanical draft, however, it would be well to state the case against the chimney.

The active force causing the flow of air and gases is the difference between the weight of the column of hot gases inside of the chimney and the weight of a column of external air of the same dimensions, the height being measured from the level of the grate. Hence for a given chimney this force, and consequently the volume discharged, increases with the difference in temperature between the external air and the gases. This force is a comparatively small one.

Take for instance a chimney 200 feet high with a temperature difference of 500 degrees F. Here the pressure per square inch is less than an ounce, though the theoretical velocity due to this, is, of course, quite high, owing to the lightness of air. By reason of the many obstructions to the flow of air, such as the grate, fuel, flues and elbows, as well as the skin or surface friction of the chimney, only a small fraction of the theoretical velocity is attained in practice. It must be remembered, however, that although the draft intensity and the volume of air moved increases with the temperature of the gases, the density decreases at the same time, so that between 600 degrees and 700 degrees F. a temperature is reached at which the weight of air handled is a maximum. Hence it will be seen that a chimney fixes once for all the maximum power of the boiler plant.

If the heating surface is such as to allow the gases to pass away at a greater temperature than the critical one for the particular chimney, great unnecessary waste is entailed, whereas if the products of combustion are cooled to a lower temperature by the heating surfaces, the intensity of draft, the rapidity of combustion, and hence the furnace efficiency, is correspondingly reduced. If considerations of economy demand an economizer or feed water heater, it is found that to obtain the necessary draft a chimney of more than 200 feet is necessary.

Large chimneys require heavy substantial foundations, often with extensive piling. They occupy a ground space in many cases of great value. They are invariably expensive, and the interest on the fixed capital represented thereby is considerable. Tall chimneys must be protected from lightning, and they sometimes annoy their owners by toppling over when the wind blows more angrily than usual.

A chimney, once built, in addition to limiting the boiler capacity, as we have seen, is subject to atmospheric conditions which cause a fluctuation of its draft. An increasing external temperature not only lowers the draft intensity, but it also increases the volume of air which must be handled in order that a given weight of oxygen may be supplied to the fuel. Varying barometric and hydrometric condi-

tions likewise have their effect. For instance, the effective heat of the furnace is reduced by an amount necessary to vaporize the moisture entering with the air, and hence when the amount of moisture is great it would necessitate an increased rapidity of combustion and consequently a more rapid supply of air in order to secure the proper furnace temperature. For this the chimney is unable to provide.

When we speak of a chimney it almost invariably calls to mind the picture of a stack belching forth dense volumes of smoke. This may be termed an inherent source of waste of a chimney, and is due to finely divided particles of carbon in the gases becoming chilled below their ignition temperature before coming in contact with oxygen, or in other words, is due to imperfect combustion. This defect of a chimney, together with its inability to efficiently burn low grades of fuel, arises from a defective air supply, that is, it is the same old story of inability to meet increased demands, such as the varying conditions of boiler practice impose.

The chimney is purely and simply a device for moving air, and for such purposes a more wasteful mode could hardly be devised. Since heat is convertible in a definite ratio into mechanical energy, we can easily compare the work accomplished with that which is expended. Assume for example, an interior temperature of 500 degrees F. and an exterior temperature of 32 degrees. Then a simple calculation will serve to show that the heat in one pound of the gases above 32 degrees F. is equivalent to sufficient mechanical energy to raise its own weight approximately a height of 90,000 feet. If therefore the chimney is but 100 feet high, only one nine hundredth part of the heat is utilized.

In other words the efficiency of the chimney is about one-tenth of one per cent. the remaining 99.9 per cent. of the energy overcoming the flue and chimney friction, escaping as radiant heat or being discharged at the top as sensible heat of the gases. This latter factor is by far the largest, of course.

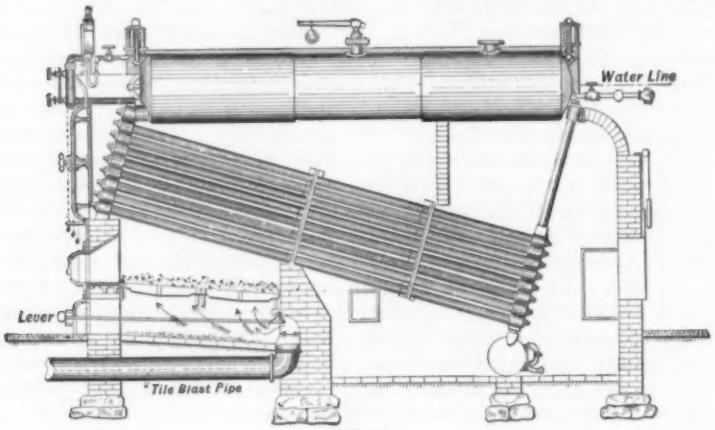


FIG. 1.

We can from this also see that the efficiency of a chimney increases as its height; a 500 foot chimney would transform into useful effect one-half a per cent. of the energy supplied it.

If now we replace the 100 foot chimney by a fan, the efficiency of this arrangement, with boiler and engine, may well lie somewhere between three and four per cent. or from thirty to forty times as great as the chimney, a figure which will be greatly increased if the fan engine exhaust is utilized. This brings us, therefore, to a consideration of draft production by mechanical means.

The first and crudest method of forced draft production was the steam jet. This is a device of exceeding

wastefulness and will not here be considered. The use of fans for draft purposes may be classified under the heads of forced and induced draft.

The first of these methods consists of forcing air under the grates of the furnace, and may be applied either by the closed ash-pit or the closed stoke-hole system, the latter being extensively used in naval practice.

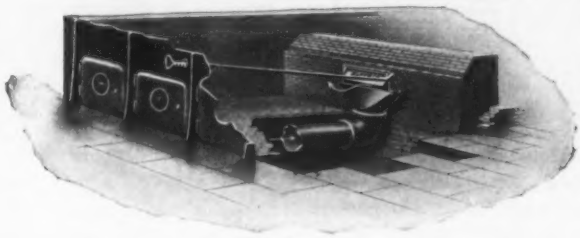


FIG. 5.

Forced draft is usually installed to provide for an increased steaming capacity; to help out an overloaded chimney, or to enable low grades of fuel to be successfully employed.

The cut shown herewith illustrates the application of forced draft to a water-tube boiler by the closed ash-pit system. These cuts were obtained from installations by the Buffalo Forge Co., Buffalo, N. Y. Air is supplied under pressure by a centrifugal fan or blower to the tile blast pipe, and is admitted beneath the grate by a damper placed in the bridge wall, substantially as indicated in the second figure. In this way the fuel receives its forced draft.

(To be continued.)

Pulley-Speed Test.

An order received some time ago by the Dodge Manufacturing Co., Mishawaka, Ind., called for an iron spider, wood rim, pulley, 46½ in. diam. and 16 in. face, to fit a 4-inch shaft, and run at a rim speed of 9000 feet per minute.

The Dodge Co. decided to make two of these pulleys, alike in every respect, and use one in a test to determine the maximum speed at which it could be run before bursting. For this test one of the pulleys was placed on suitable shafting in an abandoned room to which all approaches were barricaded.

The speed was started slowly, and gradually increased until an actual speed of 2400 rev. per minute was reached. This gave a rim speed of 28,889 feet, or a fraction under 5½ miles per minute. A 16-inch (diam.) wood split pulley was used on the same shaft.

Neither pulley showed any perceptible weakening, and as no facilities were available at the time to further increase the speed, the test had to be adjourned to some time in the future, when it is proposed to increase the speed to the bursting point.

Small Motors.

Contrary to American practice, which seldom uses anything smaller than motors of 5 horsepower for driving machine tools, says the Elektrotechniker, experience in Germany has shown that driving with small motors, despite their lower efficiency, may be more advantageous than driving with large ones. The ideal system of running is the separate motor system, by which each machine is run independently and light loads thereby avoided. But the introduction of this system depends to a great extent upon the initial cost of installation. Success has been obtained with alternate-current motors of 2 horsepower without commutator or brushes and without regulating resistance.

DYEING DEPARTMENT

Dye Recipes for November.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16 page pamphlet, in convenient form for preservation. Subscription price for the TEXTILE WORLD with the Dyers' Supplement is $4.

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

Recipe No. 161.

Yellow on Cotton Yarn.

Chloramine Yellow M on 100 pounds of cotton yarn.

Prepare the dye bath with

2 lbs.. Chloramine Yellow M.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)

15 lbs. Glauber's Salt.

Enter yarn at 180° F., bring to a boil, and dye at this temperature for one hour.

Chloramine Yellow M, although not as bright as Chloramine Yellow G G, is faster to light and washing, and is an excellent direct cotton yellow.

Recipe No. 162.

Violet on Worsted Yarn.

Acid Violet 6 B on 100 pounds of worsted varn.

Prepare the dye bath with

1 lb. Acid Violet 6 B.
(A. Klipstein & Co., 122 Pearl St., New York.)

having the bath neutral.

Enter the yarn at 120° F., bring slowly to a boil, and dye at this temperature for one hour. Add the dye stuff in portions, but below 180° F., and toward the end of the dyeing add 1 per cent. of Acetic Acid to brighten.

Acid Violet 6 B is recommended for its pure and bluish shade of violet, and its high coloring power at an exceedingly low cost.

Recipe No. 163.

Dark Blue on Cotton Yarn.

Oregon Blue Y on 100 pounds of cotton yarn.

Prepare the dye bath with

4 lbs. Oregon Blue Y.
(Anchor Color Manufacturing Co., 462 Cherry St., New York.)

20 lbs. Common Salt.

Enter yarn at 130° F., bring to a boil, and dye one hour at this temperature, concentrating the bath as much as is possible toward the end.

Oregon Blue Y is also applicable to mixed goods of cotton and wool, the dye bath being made up in the same manner, but the dyeing operation differing in that the material is entered at 170° F. and worked at this temperature for ¾ hour, brought to a boil for ½ hour, and then run cool ¾ hour longer.

Recipe No. 164.

Orange on Cotton Yarn.

Phenedine Orange R on 100 pounds of cotton yarn.

Prepare the dye bath with

2 lbs. Phenedine Orange R.
(Sykes & Street, 85 Water St., New York.)

20 lbs. Common Salt.

Enter at 170°, bring to boil, and dye at this temperature one hour.

Phenedine Orange R produces a brilliant shade of reddish orange, is of high coloring power, and has all the characteristic properties of the direct cotton colors.

Recipe No. 165.

Red on Worsted Yarn.

Cloth Red 3 G A on 100 pounds worsted yarn.

Mordant the yarn in a bath made up as follows:

2½ lbs. Tartar.

3 lbs. Potassium Di Chromate.

Enter the material at 140° F., bring to a boil and mordant at this temperature for one hour.

Then dye in a bath containing

3 lbs. Cloth Red 3 G A.

(Berlin Aniline Works, 72 Front St., New York.)

½ lb. Acetic Acid.

Enter cold, raise very slowly to a boil and dye at this temperature for 1½ hours.

Cloth Red 3 G A is one of the fastest reds on the market.

Recipe No. 166.

Black on Worsted Yarn.

Acid Black 8 B on 100 pounds worsted yarn.

Prepare the dye bath with

5 lbs. Acid Black 8 B.

(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)

10 lbs. Glauber's Salt.

2 lbs. Sulphuric Acid.

Enter yarn at 100 F., bring to a boil and dye at this temperature for one hour.

Acid Black 8 B is low in price and remarkably fast to acids and steaming.

Recipe No. 167.

Yellow on Cotton Yarn.

Canopia 1 on 100 pounds cotton yarn.

Prepare the dye bath with

3 lbs. Canopia 1.

(J. Howell Jones, 18 Burling Slip, New York.)

20 lbs. Common Salt.

Enter the yarn at 170° F., bring to a boil, and dye at this temperature for one hour.

Canopia 1 produces very brilliant shades of yellow on cotton.

Recipe No. 168.

Dark Blue on Cotton Yarn.

Alizarine Dark Blue D R on 100 pounds of cotton yarn.

Prepare the dye bath with

3½ lbs. Alizarine Dark Blue D R.

(Victor Koechl & Co., 122 Hudson St., New York.)

30 lbs. Salt.

2 lbs. Soda.

Enter the yarn at 170° F., bring to a boil, and dye at this temperature for one hour.

Alizarine Dark Blue D R has a very high coloring power, goes on the fibre evenly and possesses all the valuable characteristics of direct cotton colors.

Recipe No. 169.

Cutch Brown on Cotton Yarn.

Direct Brown No. 176 on 100 pounds cotton yarn.

Prepare dye bath with

4 lbs. Direct Brown No. 176.

(O. S. Janney & Co., 8-10 Letitia St., Philadelphia, Pa.)

20 lbs. Common Salt.

Enter the cotton at 160° F., turn while raising to the boil, and continue the boiling for one hour; wash and dry. The dye bath is not exhausted and subsequent lots require ⅓ less dye stuff.

Direct Brown No. 176 is quite fast to light and washing possessing great tinctorial power.

This yarn is particularly applicable to hosiery dyeing and for raw stock, in which case a subsequent treatment with chrome and blue stone added to the dye bath will produce an extremely fast color.

Recipe No. 170.

Yellow on Cotton Yarn.

Di Phenyl Fast Yellow G on 100 pounds cotton yarn.

Prepare dye bath with

3 lbs. Di Phenyl Fast Yellow G.

(John J. Keller & Co., 104-106 Murray St., New York.)

20 lbs. Common Salt.

Enter yarn at 180° F., work while bringing to a boil, and dye at this temperature for one hour.

Di Phenyl Fast Yellow G penetrates well, goes on the fibre evenly and its fastness is very good.

Recipe No. 171.

Red on Worsted Yarn.

Anthracene Red G N on 100 pounds of worsted yarn.

Prepare the dye bath with

5 lbs. Anthracene Red G N.

(C. Bischoff & Co., 87-89 Park Place, New York.)

15 lbs. Glauber's Salt.

5 lbs. Acetic Acid.

Enter yarn at 120° F., bring to boil,

and dye at this temperature 1 to 1½ hours; wash and dry.

Anthracene Red G N produces shades which stand washing very well, and also sunlight, and may be made fast to fulling by an after treatment with 1 to 3 per cent. of Chromium Flouride.

Recipe No. 172.

Yellow on Worsted Yarn.

Chrome Fast Yellow 2 G on 100 pounds of worsted yarn.

Mordant the yarn in a bath made up as follows:

2½ lbs. of Tartar.

3 lbs. of Potassium Bi Chromate.

Enter the material at 140° F., bring to a boil, and mordant at this temperature for one hour.

Then dye in a bath containing

3 lbs. Chrome Fast Yellow 2 G.
(Berlin Aniline Works, 72 Front St., New York.)

½ lb. Acetic Acid.

Enter cold, raise very slowly to a boil, and dye at this temperature for 1½ hours.

Chrome Fast Yellow 2 G produces a color distinguished for its exceedingly great fastness to light, scouring, alkalies, acids, and its good fastness to stoving.

Recipe No. 173.

Reddish Brown on Cotton Yarn.

Oxydiamine Brown G on 100 pounds cotton yarn.

Prepare the dye bath with

3 lbs. Oxydiamine Brown G.
(Wm. J. Matheson & Co., Ltd., 182 Front St., New York.)

2 lbs. Soda Ash.

20 lbs. Calcined Glauber's Salt.

Enter at 180° F., and dye for one hour at this temperature.

Oxydiamine Brown G is of special moment for direct dyeing, the shades obtained being distinguished for special body and brightness. It is also very suitable for dyeing unions and satins.

Recipe No. 174.

Blue on Worsted Yarn.

New Alizarine Blue N on 100 pounds worsted yarn.

Mordant yarn in a bath containing

3 lbs. Potassium Bi chromate.

2 lbs. Tartar.

Entering at 140° F., bring slowly to a boil, and work at that temperature for one hour.

Then dye in a bath containing

16 lbs. New Alizarine Blue N (Paste).
(E. M. Thayer, 112 Broad St., Boston.)

Entering cold, raising to 140° F., for 45 minutes, then boiling 30 minutes, and then adding

1 lb. Acetic Acid.

boil until bath is exhausted, the operation requiring about two hours.

New Alizarine Blue N gives a full heavy shade of blue, and is especially useful in combination with other alizarines.

Recipe No. 175.

Apple Green on Cotton Yarn.

Oregon Green No. 207 on 100 pounds of cotton yarn.

Prepare the dye bath with

3 lbs. Oregon Green No. 207.
(Anchor Color Manufacturing Co., 462 Cherry St., New York.)

20 lbs. Glauber's Salt.

Enter the yarn at 130° F., bring to a boil, and dye at this temperature concentrating the bath as much as possible toward the end.

Oregon Green No. 207 is also applicable to mixed goods of cotton and wool, the dye bath being made up in the same manner, but the dyeing operation differing in that the material is entered at 170° F., and worked at this temperature for ¾ hour, brought to a boil for ½ hour, and then run cool ¾ hour longer.

Recipe No. 176.

Garnet on Worsted Yarn.

Chromazo Red B No. 135 on 100 pounds worsted yarn.

Mordant the yarn in a bath made up as follows:

2½ lbs. Tartar.

3 lbs. Potassium Di Chromate.

Enter the material at 140° F., bring to a boil and mordant at this temperature for one hour.

Then dye in a bath containing

½ lb. Acetic Acid.

2 lbs. Chromazo Red B No. 135.

(Schoellkopf, Hartford & Hanna Co., 100 William St., New York.)

Enter cold, raise very slowly to a boil and dye at this temperature for 1½ hours.

Chromazo Red B No. 135 produces a deep shade of garnet with a low percentage of dyestuff, and is also characterized by its fastness.

Phenedine Pink J E.

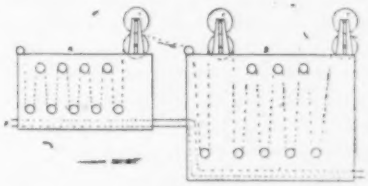
In our October Supplement a dyeing of Phenedine Pink J E was shown on combed Egyptian yarn. This color is recommended more especially for use in light percentages on bleached, plain or mercerized cotton yarn, where the brilliancy and intensity of its shade is shown to full advantage. Dark colored Egyptian cotton is not so well adapted to display these delicate shades, and the sample did not, on that account, do justice to the color.

Crepon on Half Wool by Mercerization.

The quality which cotton possesses, of shrinking excessively under the action of concentrated caustic soda, and the peculiarity of wool to stand this treatment under certain conditions, without appreciable change, permits the manufacture of half-wool crepon, which article is likely to be used in large quantities as a substitute for the all wool goods. The cloth is made with a cotton warp, and woolen, worsted, or mohair filling, and the effects produced can be varied indefinitely by the use of different weaves.

The woven cloth is first scoured with carbonate of soda. It is then rinsed and steamed on a roll. If the cloth is made with a hard, wiry wool, such as mohair or similar fibre, it is well to run it before scouring through boiling water (crabbing), with a small quantity of ammonia or carbonate of soda added to the bath, in order to make the fibre more smooth and lustrous. Next follows the mercerizing. In conducting this process, it is necessary to bear in mind the effect of alkali upon the wool fibre. It is well known that the action of alkali on wool is more energetic when weak solutions are used at a high temperature, than with strong solutions in a cold state. The essential thing in mercerizing half-wool cloth, is to use a concentrated alkali bath at as low a temperature as possible. A caustic soda bath, standing at 15 to 30 deg. Be., at a temperature of from three to 10 deg. C., will give very good results. The goods should remain in the bath but a very short time, say from one to three minutes, according to the strength of the bath and the quality of the goods.

After mercerizing, the goods are squeezed, in order to remove as much as possible of the soda, and then neutralized immediately in a cold acid bath. The machine employed for these operations consists of two tubs, provided with rollers, as shown in the illustration. The mercerizing tub is



made of iron or copper, and the squeeze and carrier rolls should be of the same material. The squeeze rolls are provided with a thick covering of cloth, or burlap. If the work is done on a large scale, some means should be provided to keep the bath at a low temperature. This is done by having a refrigerating liquid circulating in the iron pipes, placed at the bottom of the tub, or passing between the rollers.

Next to this tub is placed the neutralizing tank, which is built very similar to the first tub, and provided with rollers. This tank can be made of wood, and should be provided with the cooling arrangement already mentioned. Either hydrochloric or sulphuric acid can be used for neutralizing, and the acid can be added to the bath, while the pieces are running.

The fresh bath should be made with from 30 to 50 grams of acid per litre of water. The cloth, after having been prepared as already described, enters the mercerizing tank while in a damp state, and after coming from the acid tank, is rinsed immediately with water, and, if necessary, should be neutralized with a small quantity of ammonia or carbonate of soda.

For coloring the solid shades on cotton and wool, the direct dyestuffs can be employed in a neutral bath. The dyeing does not offer any great difficulty. For light shades, it is necessary to take some precautions, because the affinity of the mercerized cotton for the dyestuff is much greater than when in its natural state. For this reason, it is necessary to avoid too large quantities of sulphate of soda or salt, if it is desired to obtain uniform shades. Generally, it will be found necessary to prolong the boiling, in order to bring the shade of the wool to the same depth as that of the cotton. When two colors are to be made, the wool is colored first in an acid bath, and then the cotton is colored in a new bath (neutral), with direct dyes, and it is necessary to select those dyestuffs which color the wool very little, or not at all.

For two shades, with the cotton colored black, and the wool colored medium or dark shades, the order of procedure may be reversed, and the cotton colored first, and the wool afterwards. In that case, the process of diazotizing is interesting. The wool is colored with Diamine Black B H, a color which affects the cotton very little. It is dyed in the usual way, with the addition of carbonate and sulphate of soda, but at a temperature of about 50 deg. C, in order that the wool may absorb the least amount of coloring matter possible.

After dyeing, the goods are rinsed and rapidly diazotized, then rinsed again, and developed with diamine, by the addition of a little carbonate of soda. Various shades can be developed on the wool in an acid bath.

A method which permits of mercerizing and coloring the cotton black in one operation, consists in adding a sulphur black to the alkali bath. The alkali bath is made about 30 deg. Be., and from 5 to 10 grams of sulphate of soda is added, and from 20 to 30 grams of Immediate Black G, per litre. The cloth has been previously moistened, and is colored a jet black, while being mercerized. After that process the goods are run into an acid bath immediately, and then rinsed. The wool takes only a very light tint in this operation, which permits of its being colored even very light shades with the acid dyes. Mercerization is generally done before coloring, but in some cases it can be done afterwards. With few exceptions, the Diamine colors, as well as the colors used on the wool, in a neutral bath, are not affected by mercerizing after coloring. —Dr. Sohne in Farber Zeitung.

The Effect of Light on Colored Carbonized Goods.

The effect of light on colored textiles is well known, but the change under ordinary conditions occupies considerable time. It is, however, a well known fact that the effect of light on colors, when combined with certain chemicals, is greatly increased. We find a good illustration of the rapidity with which light and chemicals may act upon colors in the photographic processes.

These conditions are also found when goods which have been carbonized are exposed to sunlight. A writer in Deutsche Farber Zeitung states in this connection that he had experienced trouble with piece dyed blue goods coming out with dark ends. At times the difference of the color of the ends from the body of the piece was quite considerable. All attempts to trace the cause were at first unavailing, and he was obliged to cut the dark ends off, making a great deal of waste. Suddenly, however, the dark portion of the goods became shorter, being scarcely one-half yard long, when they were a yard or more in

length previously, but dark stripes coincident with this change began making their appearance in the middle of the pieces.

Upon making further researches, it was discovered that a change had been made about that time in the handling of the pieces. Formerly, the end of the acidified pieces had been allowed to hang down for the length of one or two folds, so that this loose portion could be used to cover the folded piece. The change consisted in folding the goods for the entire length leaving the folds exposed. When the carbonizing room was not available for storing the goods which had been saturated with acid, the pieces were put aside near a window, where they were frequently exposed to the rays of the sun. Here the sun rays struck the exposed end of the piece, which had formerly been used as a wrapper to the goods, and evidently had prepared or mordanted the goods so that in the subsequent process the color became darker. The trouble disappearing as soon as the goods were kept from exposure to the sunlight.

Scientific Color Mixing.

Absorption spectra, i. e., originally white light, analyzed after passing through some liquid, such as a dye solution, which filters off some of its constituent parts, play a great part with the color chemist, and dyes can often be recognized by their absorption spectra, and particularly by the changes which occur in those spectra when the solutions are mixed with various chemical reagents or even with water.

Thus a dilute solution of magenta transmits says David Patterson in a recent work on the science of color, almost all the colors except certain yellows and greens, and the spectrum is only minus about one-fifth of its whole length—roughly speaking the second fifth, counting from the heat end of the spectrum. As the solution is strengthened, however, the colors rapidly disappear toward the actinic end, and slowly the other way, until nothing but the red end of the spectrum is left. Absorption spectra are of much use in detecting the cause of different appearances presented by dyed fabrics, according as they are seen by daylight or by artificial light.

Another most important application of the absorption spectra is in the discrimination of good mixing colors. A blue dye, for example, which gives an absorption spectrum containing much red will not give a pure green on mixing with yellow, while one that gives a spectrum blank in the red part will answer admirably, although the two blues may be indistinguishable to the naked eye.

The constitution of white light after passing through a mixture of solutions of different colors, or through superposed glass plates of different colors, shows how tints are produced by mixing. Thus the only kind of light which will pass through both blue and yellow glass is green light. Consequently if a blue and a yellow glass both intervene between the eye and a source of white light, the sensation of green is produced. It follows at once that a combination which will transmit nothing will produce black. In theory two complimentary colors will do this if mixed, but in practice three different colored dyes are usually necessary to dye black. A mixture of red and bluish green, however, such as Azo Rubine and Acid Green will give a black if very strong.

In all cases when light reaches the eye from a dyed surface much of it has been reflected to the eye after partial penetration into the fabric, and hence after the reflected ray has passed through a certain thickness of the coloring matter, the effect produced upon the eye is thus that of the color or colors which have not been absorbed by the dye during the

passage of the reflected ray through it.

In the case of a dyed fabric, however, we have also to reckon with light which has been reflected from the very outside of the fabric, and which, therefore, has undergone no absorption, and reaches the eye as white as it was before reflection. This kind of reflection decides the lustre of the fibre, but for the same fibre it differs according to the angle at which the fibre is presented to the eye. Its action is to dilute the color effect on the optic nerve, and hence to make the tints paler. At the same time, the reflection, being less scattered, gives great richness and concentration of color when the fabric is viewed in certain directions. Hence the difficutly of matching a color on, say, silk with cotton, or some other lustreless fibre.

There are three so-called "color-constants," hue, purity, and brightness. The first is what is expressed in naming the color. The word "hue" is often used as synonymous with "shade," although the latter in the strictest sense denotes an admixture of grey or black. "Cast" is another word having the same meaning as "hue." We say blue with a greenish hue or with a greenish cast.

Purity has its obvious meaning. Probably the only pure colors are those found in parts of the solar spectrum. No dye or pigment gives an absolutely pure or "saturated" color. Brightness or clearnesss depends upon the amount of light reflected to the eye, just as hue depends upon the nature of that light. The most luminous, i. e., clearest or brightest, color is orange yellow, and the least clear is violet. A luminosity scale has been compiled of thirteen colors, in which orange yellow is denoted by the number 7,000, violet by 13, showing rapid changes in luminosity as the list is gone through.

Tints are produced by diluting with white, or by applying a dye to a white material. It is said that the limit of dilution appreciable to the trained eye with regard to light is the dilution of 360 parts of colored light to one of white. Tinting, then, implies no alteration of hue, simply a weakening of it. This is often impracticable with dyes without correction with some other color, just as the addition of white in tinting produces lighter graduations, or that of black produces darker ones which are properly called shades.

Examples of both that may be mentioned are the tinting of vermilion to yellowish pink and its shading to russet, and the shading of orange to terra cotta and its tinting to salmon color. A collection of different tints or shades of the same hue is called a scale.

In practical color-mixing the first thing is, as has already been pointed out, to know exactly what kinds of light the separate dyes will transmit, a knowledge which is gained by a study of their absorption spectra. That being known, it is easy to decide how to mix them so as to secure any given absorption, and therefore the actual residual color that may be wanted, and experience will show in what proportion the dyes have to be combined to produce any particular hue.

It goes without saying that a very large number of different hues can be got by combining a very limited set of dyes in different percentages. For example, Azo Acid Magenta, Patent Blue N, and Azo Yellow will between them produce at least fifty distinct hues, each of which can, of course, be tinted or shaded. A knowledge is necessary of what colors have to be employed for articles which have to look well by artificial light. Thus a yellow, to have a good appearance by gaslight, must have an orange cast by daylight, and on no account a greenish hue. In that case it will look pale and faded by artificial light.—G. Alexander in Dyer and Calico Printer.

QUESTIONS AND ANSWERS

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Scouring Woolen Goods.

Editor Textile World:

We changed the soap and method of finishing in accordance with your suggestions in the reply to my former question, which appeared in your October issue, and there has been a marked improvement in our goods—but they are not yet right. The wool oil which we are using is made from wool grease and other substances. Can you inform me of any method of determining whether this oil is injurious to the goods?

Leslie (18).

We cannot inform you of any method that you could use to test this oil, as the testing of oils requires delicate instruments and expert knowledge of chemistry. If you suspect the oil, a simple and effective method of testing it is to try something else, and note results.

Experiments have been made under the auspices of the United States government to determine the comparative value of oils for industrial purposes, and a table based on these experiments, has been compiled to show the comparative saponification values of different fats and oils. According to this table, of all the substances used for oiling wool, grease from the wool fibre is the hardest to saponify. The experimenter states that it is nearly impossible to saponify wool grease, and he was compelled to boil it for hours under pressure with double strength alkali (K O H).

The table includes 76 oils and fats arranged according to saponification value. Wool grease stands seventy-third on the list, being harder to saponify than beeswax, which occupies the seventy-second place.

Hydrometer Systems.

Editor Textile World:

I notice reference in July and August numbers of Textile World, in article on bleaching, to the Twaddell hydrometer. What is the difference between the Twaddell and Hydrometer.

Information (17).

Three systems of hydrometer scales are in general use: 1, Direct specific gravity; 2, Twaddell; 3, Baume. All three are constructed upon same mechanical principle, being a glass tube weighted at one end, tho whole instrument being lighter than water. The tube is marked along its length and the mark at level of liquid when instrument is immersed indicates the density. The first named instrument is graduated according to the actual specific gravity on weight of liquid as compared with waters. This system is not in general use, owing to the necessity of dealing in fractions of the specific gravity units, in order to indicate small variations in density. The Twaddell hydrometer avoids this by marking the level in pure water at 15½° C as zero (0), and then graduating the instrument so that each rise of 0.005 specific gravity is one division on the scale. The Twaddell reading can easily be converted into specific gravity by multiplying the number of degrees Twaddell by .005, and adding 1.000 to the products. For example 10° Twaddell multiplied by .005 = .05, plus 1 = 1.05 specific gravity. In both of these hydrometers the graduations are farther apart at the top of the scale than at the bottom, as an increase of specific gravity in light liquids brings more of the previously submerged part of the hydrometer out of the liquid than does a corresponding increase of specific gravity when liquid is heavier. The third, or Baume hydrometer, is graduated by calling the level in pure water at 12.5° C. zero (0), and calling the level in a 15 per cent. salt solution, 15. The intermediate space is divided into 15 equal parts, and the remainder of the stem is marked off in divisions of the same length. Consequently a difference of 1° Baume in heavy liquids indicates a greater difference of specific gravity than does a difference of 1° in light liquids. For liquids lighter than water, the Baume system of graduating is reversed. The level in a 10 per cent. salt solution is called zero and the level in water is marked 10. Thus the lighter the liquid becomes the higher are the number of degrees for liquids lighter than water. The conversion of Baume readings into specific gravity is done according to following formula: 144.3 ÷ (144.3 — Be.) for liquids heavier than water; 140 ÷ (130 + Be.) for liquids lighter than water.

Flax Fibre.

Editor Textile World:

Where can I get the best work on making flax twines, also any information regarding the Northwest flax fibres, especially in regard to their availability for making twines and bagging?

Hunter (26).

There are two books on flax and jute spinning; viz., Sharp's Flax & Jute Spinning, and Leslie C. Marshall's work. Neither of these, however, treats on the Northwestern flax fibre. During the past few years there have been many attempts to utilize this fibre commercially, and some of them have been successful to a greater or less degree. The commercial success of the question seems to depend upon the degumming or cleaning process. In our August issue, we published a lengthy article on this subject, to which our inquirer is referred.

Exports of Silk to France.

Editor Textile World:

Have there ever been any shipments of manufactured silk from the United States to France?

Buffalo (20).

The records of the U. S. Treasury Department state that manufactures of silk have been shipped from the United States to France every year for the past ten years, the value varying from $400, in 1894, to $13,139, in 1896.

Sizing Glazed Yarn.

Editor Textile World:

Please inform me how colored glazed yarns are numbered, and whether the ticket number indicates the size before or after glazing.

Glaze (6).

The glazed numbers are based upon the gray yarn numbers previous to glazing. The sizing and glazing put on the yarn changes the weight, so that the number of the gray yarn does not indicate the actual size after glazing. This change varies according to the color and kind of finish put on the yarn, and the only way to determine the actual size of glazed yarn, is to reel a sample of it.

Cotton Mills in the South.

Editor Textile World:

How many cotton yarn and cloth mills are there in the Southern States at the present time?

Index (27).

There were 459 mills in the Southern States at the time our Directory for 1900 was published in June. By the 1st of January, there will be about 500.

Spinning and Carding Machinery for a Labor Museum.

Editor Textile World:

We are organizing a labor museum, designed for an institute of industrial art, and need a small wool carding and spinning machine. Can you tell us where we can secure the same?

Museum (21).

We have answered this inquiry by mail.

Sponging Woolens and Worsteds.

Editor Textile World:

Can you inform me how to sponge woolen and worsted cloth so that the fabrics will not shrink when made into garments?

Shrunk (22).

The shrinkage of worsted or woolen cloth after it is made into garments depends more upon the construction of the fabric than upon the process of sponging after finishing. Some loosely woven, sleazy textures cannot be sponged so as to prevent shrinkage when worn, while other goods, more solidly woven or fulled, give no trouble to the wearer. The method of pressing in a rotary press, which is generally employed in finishing, has a tendency to stretch the goods, and the object of sponging is to shrink the fabric back to the condition in which it was previous to pressing. The ordinary methods of sponging shrink the goods to a comparatively small extent, and if difficulty is experienced in further shrinkage when the goods are worn, the remedy should be sought for in the selection of more firmly woven or fulled fabrics.

Handle of Hosiery.

Editor Textile World:

I send you a sample of the hosiery manufactured in our mill. We would like to know of some process to make the goods appear thick and feel heavy, and still weigh light. Can this be done by fulling?

Peter (28).

We are unable to suggest any method for increasing the bulk of our correspondent's hosiery, except by substituting a softer and more woolly thread for the cotton, which is now knit into the goods. Fulling would not make them feel heavier in proportion to their actual weight. In fact, it would have quite the reverse effect, and the more they are fulled, the more solid and firm they would become, and, consequently, the lighter they would feel in proportion to the weight. A cheap substitute for the

cotton might be used, which would give bulk, and consequently, the desired handle.

Size of Pulleys and Width of Belt Required.

Editor Textile World:

We find that our main belt is very much strained, and would like information in regard to what change would be necessary. Our main driving belt is 20 inches in diameter, runs 120 revolutions per minute, and drives a 30-inch pulley by 12-inch belt. The slack side of the belt is the top. The distance between the driving and driven shafts is 30 feet. They are on the same level. We have in our mill two mules, 360 spindles each, 14 narrow looms, one fulling mill, one washer, one wool dryer fan, one double fan for cloth dryer, one wire napper, one wool picker, one duster, one waste picker, two sets of 60-inch cards, and a 50-light dynamo. Would it help matters if we were to use a 30-inch driving pulley and a 45-inch driven pulley?

Power (19).

We estimate that all of the machines mentioned would require 63 H. P. We presume that they are not all in operation at any one time, but in addition to the actual power required to drive the machinery, there is an additional item of power to drive the shafting, which varies greatly, according to the conditions under which the shafting is operated, its alignment, size, and the tension of the belts.

Actual tests made throughout the country, a few years ago, in establishments, show that from 40 to 70 per cent. of the power was used for driving the shafting. Assuming that that portion of the machinery which is standing will equal the power required to drive the shafting, the belt would have 63 H. P. to transmit. The power that a heavy double belt will transmit is estimated by multiplying the velocity of the belt in feet per minute by the width of the belt in inches, and dividing the product by 500. In this case, it would be: velocity, 628 feet, multiplied by width, 12 inches, equals 7536 divided by 500 equals 15 H. P. In other words, 63 H. P. is put on a belt adapted for 15. If the same proportion is retained in size of pulleys, the line shaft will run 80 revolutions per minuate, as at present. This is too slow. It necessitates tight belts, wide belts, or extremely large pulleys throughout the mill, with a consequent increase of friction and great loss of power. Within a reasonable limit, the power transmitted by a belt increases with the speed of the belt. As any charge in speed of line shaft would necessitate expensive changes throughout the mill, we will assume it is desired to run the shaft 80 revolutions per minute, as at present. If a 30-inch driver is used, running 120 revolutions per minute, and a 45-inch driven pulley, it would be necessary to use a belt 50 inches wide to transmit 63 H. P. easily. This is wider than is desirable. If the speed of the main shafting is increased to 160 revolutions per minute, say a 40-inch driver and a 30-inch driven pulley, a 25-inch double belt would be needed, estimated as follows: 63 times 500, divided by speed of belt in feet per minute 1256, equals 25. The method of estimating that we have used gives good results that afford a margin of safety. The belting will last longer; there will be less friction; less slipping of belts; and a more uniform speed of machinery. The change suggested will, of course, help matters, but will be far from sufficient. A good pulley cover or belt dressing to prevent belt slipping would also help materially.

Mohair.

Editor Textile World:

Will you inform me where I can get information regarding the fleece of the Angora goat; also, market for same and value thereof, and any other information of value on the subject?

Angora (24).

A very complete work, entitled "The Angora Goat," by S. C. Schreiner, will give you information on this subject, and the Textile World has published articles from time to time on the subject.

The principal market for mohair is at London, as the bulk of the world's product of mohair is manufactured in Bradford, England. There are several large mills in this country that are extensive purchasers of mohair, and purchase their supplies in London. We have sent by mail the address of dealers in this country who handle mohair.

Advances on Cotton.

Editor Textile World:

Can you give us the addresses of any firms that advance money on cotton for mills, to be paid for as used?

H. C. W. (25).

We do not know of any parties who make a general business of advancing on cotton in this way except to local mills. Usually mills arrange with their local banks to carry the cotton, or, in some instances, large cotton dealers arrange to give time. In some of the larger cities, there are warehouse concerns who advance on goods stored with them, such as the Philadelphia Warehouse Co., in Philadelphia, but we do not think that they would loan on goods that were not in their possession.

New Publications.

Science of Color Mixing, by David Paterson. D. Van Nostrand Co., New York. Five colored plates; 41 illustrations; and 11 dyed samples; 124 pages; price $3.00. This work deals with the subject of Color Mixing in such a way as to commend itself to the practical man who will find here the information he needs, presented in clear, concise language, and freely illustrated with colored plates, dyed samples and diagrams. The following summary of contents shows scope and arrangement of work: chapter 1, Color Sensation; chapter 2, Analysis of Light; chapter 3, Examination of Solar Spectrum; chapter 4, Color by Absorption; chapter 5, Color Primaries of the Scientist vs. the Dyer and Artist; chapter 6, Color Mixing; chapter 7, Secondary Colorings; chapter 8, Tertiary Shades; appendix, Plates with dyed specimens.

Recent Improvements in Textile Machinery Relating to Weaving; Part 2. Philadelphia: E. A. Posselt, author and publisher. Price $3.00.

This is a continuation of Part 1 issued three years ago, giving descriptive illustrations of the construction and operation of the most modern makes of looms, jacquards and card cutting machinery, warpers, dressers, spoolers, etc.; also illustrating and explaining the latest improvements in shuttles, temples, pickers, reeds, heddles, harnesses, etc.; the various subjects being explained with over 600 illustrations.

The object of the new book is to keep improved weaving machinery and such machinery as used in connection with it, up to date before the public. The new book is not a reprint of Part 1, but an entirely new book, starting to explain modern weaving, etc., machinery from where Part 1 stopped.

The first division of the work is devoted to Shedding Mechanisms, and others treat of Box Motion and Shuttle Boxes, Let-Off Mechanisms, Take-Up Mechanisms, Picking Mechanisms, Shuttles, Temples, Jacquards and Card Cutting Machinery, Spooling, Winding, Warping and Beaming Machinery, ending with a chapter on miscellaneous weaving mechanisms. The 174 pages of compact matter furnish a very complete and valuable account of the machinery which has brought the art of weaving to its present high state.

It may be obtained from Guild & Lord, 620 Atlantic, Ave., Boston. $3.00

The World's Work. Doubleday, Page & Company, New York. The first issue of this new monthly magazine beginning with November, carries with it the promise of future success. Its pages are of ample size, filled with attractive illustrations and readable matter on subjects of current interest, beginning with an editorial department on the events of the month, which is followed by 15 articles and ending with a department entitled Among the World's Workers. The publishers have erected in the first number a high standard for their future work and we wish them the success which will accompany a maintenance of it in subsequent issues.

Cotton Movement and Fluctuations. Latham, Alexander & Co., New York. A neatly bound volume of 157 pages in which are given statistics relating to the growth, shipments, supply, consumption and prices of cotton from 1895 to 1900 inclusive, making a useful book of reference for grower, dealer and manufacturer. It contains a review of the cotton trade of the world by Thomas Ellison, and an annual review of the cotton trade for past season. This book is not for sale, but is distributed by Latham, Alexander & Co.

American Correspondence School of Textiles. Catalogue: New Bedford, Mass. This catalogue shows the plan, scope and methods of a school which can be attended by our mill workers without interruption of their mill work. Distance or financial considerations prevent most of our young mill workers from availing themselves of attendance at the regular textile schools. Assuming that a young man is ambitious and willing to study, we believe that the combination of practical manufacturing in which he is engaged, and the knowledge gained by a correspondence school, possesses advantages which our ambitious mill workers should not neglect. The catalogue gives full particulars as to course, tuition, etc., and shows specimen pages of the papers, and will be mailed to any one sending address to American Correspondence School of Textiles, New Bedford, Mass.

The Review. A Journal of Colors and Dyewares. Sykes and Street, New York. The first number of a journal devoted to the interests of dyers, and distributed gratuitously to the trade. It begins with an article by Dr. Chapin on St. Denis Blacks, which is followed by others on Direct Greens, Notes on the Bleaching and Dyeing of Straw and Chip, Cachou de Laval N., and a chapter entitled Notes and Comments. Copies can be obtained by application to the publishers.

The Sturtevant Steel Plate Fans. B. F. Sturtevant Co., Boston, Mass. The third edition of a catalogue devoted to the illustration and description of the many styles of steel plate fans made by the Sturtevant Co. It will prove a valuable aid to users of such fans in making a selection for any special service. Excellent illustrations of each type of fan accompany a detailed description. Many useful tables are added, relating to movement, pressure and temperature of air, size and weight of pipes, areas of circles, etc.

The Gould Manufacturing Co. Catalogue A. This is a book of 344 pages containing a complete list of the pumping appliances manufactured by The Gould Manufacturing Co., whose works are at Seneca Falls, N. Y., and warerooms at 16 Murray St., New York City. Illustrations and price lists accompany a description of the various pumps. It is difficult to imagine a pumping service which cannot be supplied by apparatus shown in this catalogue.

Lumber Dry Kiln Catalogue. American Blower Co., Detroit, Mich. This catalogue, No. 117, opens with an interesting chapter on lumber drying, and the Moist Air Dry Kiln and "A B C" Blower Dry Kiln are described. Many illustrations serve to bring the subject clearly to the reader's attention.

Power and Transmission. Power and Transmission appears for October in new magazine form. It will be issued quarterly hereafter, in October, January, April and July. In its new form and under new editorship, it is an attractive publication, which power users and especially those interested in rope transmission, will find of interest. The subscription price is 25 cents a year. Sample copies will be mailed on application. Power & Transmission Publishing Co., Mishawaka, Ind.

Report of Statistics of Labor. Part II of this report issued by Mass. Bureau of Statistics of Labor has recently been issued and will be sent to any address on application to this Bureau, State House, Boston, and enclosing six cents in stamps for postage.

Color Cards Recently Received.

Benzidine Colors on mercerized yarn. Farbenfabriken of Elberfeld Co., New York.

This card contains 54 shades on mercerized yarn, ranging from delicate drab and pink to a jet black. Formulas accompany the samples, and information is given as to the fastness of these shades to sunlight and washing.

Sulfur Black T. Berlin Aniline Works, New York.

A card containing eight samples colored black with this dye, which supplies a fast color combined with simple method of application. Users of fast black should send for this color card which gives instructions for dyeing and after treatment.

Congo Fast Blue H W, Berlin Aniline Works, New York.

This card shows samples of union cloths having cotton dyed with Congo Fast Blue H W, and wool dyed with Wool Blue 2B. The results cannot fail to interest dyers of union goods.

Oxy Diamine Brown G, Wm. J. Matheson & Co., New York.

Contains 18 samples of cotton yarn, loose cotton, sateen, raised cotton cloth, satin and Italians, dyed with Oxy Diamine Brown G.

Industrial News.

—In spite of the disturbing influences due to election times, the Buffalo Forge Co. report an increasing activity along their various lines. Owing to press of work in their engine department, they have been compelled to run night and day on that branch of the work to keep up with orders.

—Messrs. Hoopes & Townsend of Philadelphia, Pa., have contracted with the American Bridge Company to build a Bar Mill building 70 feet by 500 feet on the line of the Trenton cut-off of the Pennsylvania R. R.

What Other Mills Say of Cling-Surface.

Cling-Surface is reported as giving very surprising results in belt service wherever it is used. The Lenox Mills, Philadelphia, Pa., say "Results have been most satisfactory. Belt has improved in condition and has not slipped since Cling-Surface was applied. It gives all the beneficial results you claim for it."

Elkin Mfg. Co., Elkin, N. C., say "Cling-Surface is making our belts pull a full load without slipping." A. T. Atherton Mach. Co. say "Cling-Surface is the best material for belts we have ever used."

Bemis Mills, Watertown, Mass., say "Cling-Surface is all you claim for it, giving better results than we expected."

Write for This.

Copy of a very remarkable letter and photograph of belts in the Hope Mills, Hope Mills, N. C., can be had for the asking of the Cling-Surface Mfg. Co., Buffalo, N. Y.

It shows some new possibilities in belt service. Ask for it.

Electric Power for Looms.

Electricity as a motive power for looms has made much progress in St. Etienne, where there are at present 2380 weaving shops employing electricity and running 5369 ribbon looms. These looms were formerly worked by hand, and the amount of strength needed to operate them made this work one exclusively for men. With the motive power, however, lighter female labor can be employed, and the result in the future will be the substitution of female labor in a field, in which male labor has heretofore had no competition.

Murphy Trimming and Welting Machine.

W. C. von Buchwald, 120 North Seventh Street, Philadelphia, is the sole agent for this machine, which is now being introduced to the trade. All the parts are hardened and ground, which gives it great durability. The automatic tension in this machine enables the full elasticity of the thread to come into play, so that it does not break or draw the goods.

The machine has a positive feed, which is not easily disarranged, and the stitch is kept regular at all speeds. Threading is very simple, as it is all done outside of the machine. It is claimed that it will run 3500 stitches per minute, and sew any kind of material, from the heaviest to the lightest.

Mr. Von Buchwald would be pleased to send samples of the work upon application from anyone interested. He is equipped to do repairing of all kinds of sewing machines, and rebuilds, re-japans and alters any make, besides building special machines. He also furnishes the twin-needle machines, W. & G. systems, for taping, cording, shoe staying, and corset work. Trimmers are put on all machines, and folders and binders are made to order.

Air Brake for Looms.

A French patented device for increasing production of looms is noted in Monteur de la Teinture. It consists of an air brake attached to the loom lay; this

brake is automatically applied when the lay moves back and is released as the lay returns to beat up the filling.

It is claimed that with this brake attached, a loom can be run 30 per cent. faster than without it.

Dixon's Silica-Graphite Paint.

The girders of the Park St. bridge over the Big Four R. R. at Cincinnati, Ohio, were painted with Dixon's Silica-Graphite Paint, which has for five years successfully resisted the action of sulphur fumes from the engines which pass under this bridge at the rate of 500 daily. The Joseph Dixon Crucible Co., Jersey City, N. J., have issued a folder with an illustration of this bridge, and are naturally desirous that others requiring a durable paint should avail themselves of the advantages which accompany the use of their graphite paint.

Perforated Sheet Metal.

Textile manufacturers will be interested in learning that they can obtain perforated sheet metal from A. J. Beckley & Co., Garwood, N. J., such as is used in textile mills, for wool scouring

and top dyeing machines, screens for dusters, hydro-extractors, bur pickers, etc. The illustration shows a screen made by Messrs. Beckley & Co. for a wool duster.

This firm make a specialty of perforated metal, and are equipped to furnish it promptly in any form or style of perforation required for textile or other industries.

Report on Diffusion of Light.

The report on the experiments by Prof. Charles L. Norton at the Mass. Institute of Technology, on the diffusion of light by various kinds of window glass, has been published by the Associated Factory Mutual Companies. It is illustrated by drawings and reproductions of photographs of the room lighted through different makes of glass. The conclusions reached by Prof. Norton will be read with interest and cannot fail to diffuse light on the subject. The pamphlet contains an introduction by Edward Atkinson.

Do You Know Exactly What Your Plant is Worth?

The following letter from a firm that had recently received an appraisal of their mill property from the American Appraisal Co., Milwaukee, Wis., shows the character of work done by this company:

Richmond, Va., July 20th, 1900.

The American Appraisal Co., Milwaukee, Wis.

Gentlemen:—We received from you a few days ago the inventory, invoices, and plans, which you recently made of our plant, and wish to congratulate you on the very complete and thorough manner in which this work was done, and we have inspected same carefully and cannot find any errors, and think that every large manufacturing establishment should have their plant so appraised. In our own case we have always been very careful to watch the values, but since receiving your inventory we have found it necessary to increase insurance in several buildings.

We take pleasure in enclosing you herewith our check in full, and remain, yours very truly,

Richmond Cedar Works,
J. Scott Parrish.
Ass't Gen'l Mngr.

New York Blower Co.

The various styles of blowers, heaters, exhausters and engines manufactured by the New York Blower Co., 39 Cortland St., New York, and 185 Summer St., Boston, are described in an illustrated catalogue just issued.

Attention is called to their Steel Plate Exhausters for ventilating, also for conveying raw stock, dust, shavings, etc., and for removing steam from dyehouses. The catalogue contains a useful table of speeds, capacity and horse power of the exhausters, sizes of branch pipes for saws, planers, matchers, etc., table of weight of round galvanized iron pipe, and a diagram showing weight of rectangular galvanized iron pipe.

This company builds a full line of horizontal and vertical engines for ventilating and blower work, and any parties intending to install plants of this kind should get posted on the New York Blower Co.'s machinery.

Cross Oil Filter.

The Westinghouse Air Brake Co. have just ordered from The Burt Mfg. Co. of Akron, Ohio, a large Cross Oil Filter to equip their power house.

Widest Hand Loom Table Cloth.

The widest hand loom table cloth ever made is, according to the Draper's Record, now being woven at Ardoyne, Ireland. The cloth is 5 yards, 6 inches wide, contains 20,000 warp threads, and the filling has 200 threads per inch. 300,000 yards of yarn are required for a square yard.

—Virginia, Staunton. A proposition in regard to knitting mill at this place, is now being discussed by the City Council. Mr. Bockee of Dey Street, New York, has made an offer to locate a $40,000 knitting mill here, provided the city furnish a building for small rental and water and taxes free.

—Wisconsin, Hartford. It is reported that A. Uber & Bros. will erect a new building near their cannery, to be equipped and started up as a knitting factory.

Weighting Fabrics.

A method of making the filling or weighting material incorporate itself more closely with the fabric is patented by W. Brothers, of Prestwich, Eng. It consists in treating the goods with a solution of chloride of calcium and then with a solution of a soluble sulphate, thus precipitating on the fibre a practically insoluble filling of calcium sulphate. The calcium chloride solution should be of about 28 deg. Tw., and the sodium sulphate solution should be saturated.

The goods are first steeped in the calcium chloride for a few seconds, passed through squeezing rollers, and may then be saturated with the sodium sulphate solution. The inventor, however, thinks it preferable to dry the goods before entering into the second solution.

After the completion of the process the cloth is washed in water to remove any trace of the sodium chloride solution adhering to the fibres. Yarn may be treated in the same manner.

Cellulose Preparation for Artificial Fibres.

A method of preparing cellulose, published by the Mulhouse Society, consists in converting the cellulose, hydro-cellulose, or oxycellulose into a condition of hydration, when it is particularly liable to react, and is susceptible to the action of chemical agents.

It is then subjected first to the action of concentrated caustic soda in cold aqueous solution for about an hour, then it is mixed with a finely pulverized salt of copper, and afterwards this mixture is dissolved.

Persons Seeking Homes.

Persons seeking homes or investments, or firms and corporations seeking locations in the South and who desire information about Tennessee would do well to address Robert Gates, special industrial and immigration agent, Louisville & Nashville R. R. for Tennessee, at Nashville, Tenn.

—Texas, Waco. The Business Men's League is now endeavoring to secure the organization of a company to build, equip and operate a knitting mill. A committee, of which L. G. Penry, is chairman, has been appointed to make investigations in the interest of the new project.

—Vermont, Bennington. The old Aldine Knitting Mill, which has been idle for a number of years, has been purchased by L. A. Graves to satisfy an execution of $2,643.00.

—Vermont, North Montpelier. Geo. F. Sibley's woolen mill, which has been shut down for several weeks, will soon be restarted.

—Virginia, Basic City. G. T. Alexander is interested in a company which is being formed here for establishing a woolen mill to manufacture blankets. It is proposed to have a plant with capacity of 1600 per week.

—Virginia, South Boston. W. C. Bruce of Baltimore, Md. and others have been examining a site on the Staunton River, some distance from here, where they contemplate locating a cotton mill.

—Wisconsin, Appleton. J. A. Hawes, treasurer of the Appleton Knitting Company, has sold his interest in the concern to J. S. Rossiter of Chicago.

—Texas, Denison. The American Cotton Spinning Co. will increase the capital stock from $100,000 to $200,000 for purpose of making extensive enlargements and improvements. New warehouses and tenements will be erected and new lighting and heating apparatus installed, and the capacity increased by installation of new machinery. The company has 15,000 spindles and partial equipment for 40,000 spindles, which they contemplate having in operation soon. W. B. Munson is president of the concern.

Planing Mill Exhausters.

The B. F. Sturtevant Co., Boston, Mass., describe the many types of steel plate planing mill exhausters in catalogue No. 101. Illustrations present the machine clearly to the reader and are accompanied by details as to size, speed, weight, etc. Useful tables relating to velocity, volume of air, horse power, pressure and circle areas are added.

Size of Mercerized Yarn.

Jas. J. DeLong informs us that all mercerized yarn sold by him, is marked with the actual size after mercerizing, so that orders placed for any size of mercerized yarn will be filled with yarn of the size wanted.

An Old Item.

A correspondent sends us in a personal, for which he does not claim freshness, but which, on the contrary, dates May 15, 1847. An old diary records that one, Jacob Lovejoy, commenced work in No. 4 mill on the Hamilton in Lowell, as boss weaver, and that in the summer of 1855 he had the looms built over. Sept. 13, 1847, is noted as rather a rainy day, but probably nothing but a shower as it has only rained four days.

Fuel Economizer.

The Dartmouth Mills, New Bedford, have placed a contract with the Green Fuel Economizer Co. for immediate delivery of one of their machines with a view to obtaining the benefit of the saving to be had on their winter coal bill.

—The Hamilton Co., at Lowell, are believers in lightning-rod protection. They are having new rods placed on their tower, which is 200 ft. high, carrying the wire cable over the tower so as to connect with the ground at both ends, making a complete circuit. The question of the value of lightning rods is a disputed point. Probably rods which are properly connected and kept in good order and well grounded will furnish protection, but unless a system of rigid inspection of the rods is pursued, it is a question of sometimes being of more harm than good.

Clips for Tenter Frames.

A device for adjusting the swinging jaw which nips the cloth relatively to the cloth plate, and so as to ensure a firm grip on the fabric, and also means for more efficiently keeping the jaw out of action until the right moment, has been patented in England. A feeler of sheet metal is prevented from entering a slot in the cloth plate by the cloth itself, but when the latter is withdrawn from under the feeler, the feeler by going into the slot brings the swinging jaw instantly into action. A lever is also provided by means of which the jaw can be raised by cams. A projecting nose prevents the lever from being pulled too far.

Rangeley Cotton Worsteds.

In our October review of the cotton worsted market, the Rangeley fabric sold by F. Victor and Achelis, was quoted at $1.05. We should have said $1.07½. We learn that this line of goods has not been sold this season for less than the last named figure.

Humidifiers.

Among the recent orders received by the American Moistening Company for their humidifiers, we note the following: Century Cotton Mills, So. Boston, Va.; Guerin Spinning Co., Woonsocket, R. I.; Covington Cotton Mills, Covington, Ga.; Millen Cotton Mills, Millen, Ga.; Clayton Cotton Mills, Clayton, N. C.

In addition to the above, repeat orders have been received for these humidifiers from the Lockwood Company, Waterville, Me.; Montmorency Cotton Mills, Montmorency, Que.; and the Lawrence Manufacturing Co., Lowell, Mass.

Hosiery Stamps.

The Champion Hosiery stamp patented and manufactured by Wilfred Wells, 505 West Lehigh Avenue, Philadelphia, Pa., has, since its introduction in 1896, thoroughly proved its merit, as is shown by the steadily increasing sales. Four thousand were manufactured and sold in 1899.

The metal used in their construction, it is claimed, is much superior to brass. The impression is clear in outline, and lacks the blurred appearance of impressions made frequently by brass stamps. In addition to giving a clean cut impression, the stamp possesses the advantage of having the letters so firmly fastened in the bed that it is almost impossible for them to become loosened. This metal bed is very light, which makes the Champion stamp a clean, light and durable tool.

Mr. Wells also manufactures blocks for printing fancy designs on hosiery.

—*Tennessee, Knoxville. The Doe River Woolen Mills, recently partially destroyed by fire, have been sold at a court sale to W. S. Whitney. It is reported that Mr. Whitney represents Eastern parties, who will build a large factory.

—*Texas, Barker. It is now learned that the Meadowbrook Cotton Mill, W. F. Smith, manager, will not be rebuilt, the project having been abandoned.

Washing with Sodium Peroxide.

A German patent has been obtained for washing with sodium peroxide and soap. A cold solution of the soap is mixed with the peroxide, not in sufficient quantity to produce any bleaching action, but simply enough to reinforce the effect of the soap. The peroxide is used in the form of powder mixed with carbonate of soda. It is asserted that the washing is made more rapid and thorough by the employment of the peroxide.

Mechanical Draft.

In a recent paper on Mechanical Draft read before the New England Cotton Manufacturers' Association, Walter B. Snow states that from a comparison of a considerable number of plants it appears that under ordinary conditions:

"A single forced-draft fan with direct-connected engine and short stack can be installed for less than 20 per cent. of the cost of a brick chimney;

"A single induced-draft fan with direct-connected engine and short stack will cost less than 30 per cent. of a chimney, and that

"A duplex induced-draft apparatus consisting of two fans with direct-connected engines, inlet and outlet connections and short stack will cost but little more than 40 per cent. of a chimney. The latter arrangement is only employed where as in the case of an electric lighting plant, it is the practice to introduce relay units."

—The American Bridge Company have commenced making very large shipments on account of the steel work for the Subway in New York City. Already about 2000 tons have been shipped, and the material is now being sent in at the rate of about 100 tons per day. The total contract comprises about 80,000 tons of structural material, and is being manufactured at the Keystone plant of the American Bridge Company.

—Messrs. Goddard Brothers have ordered a Green Economizer to be installed at their Ann and Hope Mills at Lonsdale. They bought this make of economizer in '95 for their bleachery, which is still in service.

Not What They Expected.

A curious phase of the trust system has recently developed in a little town in Michigan. One or two industries in the town had been taken into combinations and trusts and the plants closed, and the town, therefore, welcomed with open arms a new shade cloth factory, in which one of their citizens was interested in connection with outside capital. A company was formed and the local people subscribed a bonus, and the local manager, who had besides invented some special machinery, took stock in the new company in payment for his interest, the idea being to operate an independent concern. The chagrin of the manager and townspeople can be imagined when it was learned that the out-of-town Board of Directors who held a controlling interest had closed a contract with the Columbia Shade Cloth Co., the trust corporation, agreeing to sell to them a limited

amount of cloth during the year and to sell to no other concern, nor make any more goods. As the possible production of the plant is about five times the amount of the contract made, the townspeople naturally feel indignant at this perversion of their intentions.

—The American Bridge Company is furnishing from its Minneapolis plant the structural steel for the roof of the State Hospital at Glenwood, Iowa.

—The structural steel work of the Germantown Junction Station of the Pennsylvania Railroad will be furnished by the American Bridge Company.

—The Northern Pacific Railroad Company will build new shops at Brainerd, Minn., the steel work of which will be furnished by the American Bridge Company.

—Daniel Mason, of 12 Clark St., Paterson, N. J., is about to move into larger premises in the Vooris Mills. Mr. Mason handles all kinds of silk yarns, including schappe, fringe, raw and colored waste.

—The new ship building plant of the Risdon Iron Works, at San Francisco, California, will be built by the American Bridge Company, of New York, and will consist of a boiler shop, machine shop and foundry, all of the latest design and most modern description.

—Rhode Island, Pawtucket. At a recent meeting of the stockholders of the Dexter Yarn Co., S. Willard Thayer was elected treasurer and general manager of the concern, succeeding the late Gen. Olney Arnold. S. F. Dexter, who resigned his position as secretary, has been succeeded by Byron W. Waterman, formerly bookkeeper.

MILL NEWS.

Cotton.

New Mills.

—*Alabama, Alexander City. The Alexander City Mills have been incorporated with capital stock of $200,000 by Col. W. F. Pinchard, J. M. Lewis, D. L. Lewis and others. A 10,000 spindle mill will be erected. This project was first mentioned the latter part of 1899, but nothing was assured at the time.

—*Alabama, Anniston. The Woodstock Cotton Mills, capitalized at $160,000, with Jno. H. Noble, president; J. Keith, Jr., treasurer, and R. Lucas, superintendent, will start production of goods about November, making hosiery yarns, 15s, 18s, 20s and 22s principally. Mill has an equipment of 5000 spindles and is operated by steam.

—*Alabama, Huntsville. Work has now been started on the bricklaying of the new Lowe Cotton Mill. The work will be pushed to completion as rapidly as possible.

—*Alabama, Scottsboro. The new mill to be erected at this place and in which S. S. Broadus is interested, will be known as the Broadus Cotton Mills.

—*Alabama, Uniontown. The Ellawhite Cotton Mills, under construction, expect to be ready to start in about sixty days.

—*Arkansas, Monticello. The Anderson Cotton Mill has been organized with capital stock of $80,000 to manufacture cotton cloth, yarns, etc. Among those interested are J. Williamson & Son, Wm. Anderson, T. H. Mathews and C. T. Harris. They have already secured $63,700 toward the enterprise.

—*Connecticut, East Hampton. Starr Bros. have commenced installation of machinery in their new mill, recently completed.

—Georgia, Atlanta. The Harmony Mills have been incorporated with a capital stock of $35,000, by George Ware, A. C. Hook, and P. M. Tate. They propose manufacturing cotton and other textile fabrics.

—*Georgia, Canton. Work has been started on the erection of the Canton Cotton Mills. The main building will be 56 by 243 feet, two stories. The plant will have an equipment of 5000 spindles and 150 looms when completed. R. T. Jones is president of the concern. In a previous issue it was erroneously reported that plant would soon be completed.

—*Georgia, Covington. It is expected that the brick work on the Covington Cotton Mills will be completed in a short time and that the mill will be ready to start operations during December.

—*Georgia, Eatonton. The Quintet Mfg. Co., reported organized a few months ago, has purchased machinery and will start manufacture of yarns.

—*Georgia, Eatonton. The Middle Georgia Cotton Mills have let contract for erection of their buildings. This concern of which B. W. Hunt is president, contemplates having the plant, which will spin and weave, ready to start operations by the first of July, 1901.

—*Georgia, La Grange. Contract has now been let for erection of the Unity Cotton Mills, about which we have made previous statements. Duck and heavy osnaburgs will be made. The building will be 300 by 104 feet, and is to be completed by April 1st, 1901.

—*Georgia, Lawrenceville. Work is progressing on erection of the Gwinette Cotton Mills; the buildings now being erected as far as the second story. About 15 houses for the operatives have also been completed.

—*Georgia ,Rome. Contract has been awarded for the erection of the buildings for the Anchor Duck Mill, recently formed with capital stock of $20,000. The main building will be 100 by 80 feet. Orders have already been placed for thirty

looms to be installed when building is ready. This is the plant in which C. E. McLin is interested.

—*Georgia, Social Circle. The Social Circle Cotton Mills have been organized with J. B. Robinson, president; J. M. Hurst, vice-president and J. L. Newton, secretary and treasurer. We are advised that they have enough money to build and equip a 5000 spindle mill. Nothing has yet been purchased.

—*Georgia, Sparta. The Sparta Cotton Mills have been organized with a capital stock of $450,000. Application has been made for a charter. It is thought that the company, in which E .B. Baxter (Augusta), is interested, will utilize the old Sparta Cotton Mill, long idle, and equip it with the latest improved machinery.

—*Georgia, Tennille. Work has now been started on installation of machinery in the new plant of the Tennille Cotton Mills. It is expected that the mill will be ready for production of goods in December.

—*Georgia, Winder. The Winder Cotton Mills, whose plant is now under construction, and of which J. C. DeLaperriere is president and R. L. Rogers, treasurer and agent, expects to start production of goods Jan. 1st, 1901, making print cloths. The mill will have 5000 spindles and 300 looms. Steam will be power used. Goods to be sold through Robinson & Shackelton.

—Illinois, Waukegan. E. E. Cleveland, (Lock Box 76), contemplates engaging in the manufacture of cotton sheetings and drills, and is now looking for a man who has had experience in starting and equipping Southern mills to assist him in the selection of location, plans and equipment, and to take charge of construction of building and installation of machinery. The project is yet in its earliest stages, and nothing has been arranged, and will not be until the right practical man is found.

—*Louisiana, Hammond. The Board of Directors of the Hammond Cotton Mill Company has voted to postpone building operations, which were to have started shortly, until after the election.

—*Louisana, Shreveport. D. S. Monroe has been appointed to supervise the construction of the Hargrove Cotton Mill, upon which work will be started in a short time.

—*Massachusetts, Adams. All the looms are now in operation in the Berkshire No. 4 Mill, and all the machinery, with exception of the spinning room, is now running.

—*Massachusetts, Taunton. All of the departments of the Winthrop Yarn Mill are now being operated in full, giving employment to about 75 hands. The mills do not contemplate working nights this year.

—*Mississippi, Gloster. The Gloster Cotton Manufacturing Company has now decided to draw on its subscriptions for the purpose of proceeding with the erection of the necessary buildings, etc.

—*Massachusetts, Lowell. We have been informed by the Shaw Stocking Company, that the new yarn mill, upon which they began construction, Oct. 12, will be ready to start operations by March making cotton yarns, both combed and carded, for their own hosiery business. The new mill will be equipped with 5,700 spindles.

—*Mississippi, Laurel. The Laurel Cotton Mills do not expect to begin operations before the first of January. George S. Gardiner is president, H. Thom. Cottam, vice-president and W. B. Rogers, secretary and treasurer of the company.

—*Mississippi, Moorhead. Work is now progressing on erection of the Moorhead Cotton Mills, of which C. H. Pond is president. It is expected that the plant will be ready to start operations about November.

—*North Carolina, Concord. The main building of the Cabarrus Cotton Mill is now nearing completion and it is hoped to have it ready for installation of machinery in about two months. The Gibson Manufacturing Co.'s buildings are also nearing completion. This mill expects to be ready to produce goods by first of next year.

—*North Carolina, Ephesus. The machinery is now being installed in the Cooleemee Cotton Mills, at Cooleemee Falls. Full report previously given.

—*North Carolina, Gastonia. It is expected that the Arlington Mills will be ready to begin operations November 1st. The machinery is now being installed.

—*North Carolina, Lexington. The Nokomis Cotton Mills, capital stock, $100,000; C. A. Hunt, president and D. H. Hinkle, treasurer, will begin operations in January, 1901, making white goods. This mill will have an equipment of 5000 spindles and 150 looms. Steam will be motive power.

—*North Carolina, Gastonia. The Arlington Cotton Mills inform us that they will begin operations Nov. 15th, making 40s to 60s yarns. This company has capital stock of $130,000; G. W. Roger is president and treasurer, and J. M. Torrence, superintendent. Mill, which is equipped with 6000 spindles, is to be operated by steam.

—*Oklahoma Territory, Oklahoma City. A company with $100,000 capital stock is to be organized here and a cotton mill erected with a equipment of 5,000 spindles. The City Club is now taking active interest in the enterprise and will assist in raising the necessary money, so that corporation can start with a paid up capital. This is revival of project mentioned some time ago.

—*Pennsylvania, Pittston. The Franklin Mills is the name of the new plant established at this place by Edward J. and William H. Rutledge. As previously reported, they will manufacture silk and cotton tapes, braids and bindings.

—*South Carolina, Camden. A charter has been granted to the De Kalb Cotton Mills. This company, of which E. M. Boykin is president and treasurer, and T. C. Duncan, vice-president, has a capital stock of $200,000. Work has already been started on construction of the plant.

—*South Carolina, Columbia. The Capital City Mills, incorporated with

capital stock of $100,000, and whose plant is equipped with 6,200 spindles, are now ready to begin operations.

—*South Carolina, Greenville. The Monaghan Cotton Mills, of which Thos. F. Parker is president, and which are equipped with 25,000 spindles, will soon start operations.

—*South Carolina, Whitmires. The Glenn-Lowery Manufacturing Company, which is erecting a large cotton mill at this place, have decided to increase the capital stock to $500,000.

—*South Carolina, Woodruff. The Woodruff Cotton Mills have now started work on construction of the buildings.

—*Tennessee, Knoxville. The machinery is now being installed in the new plant of the Knoxville Cotton Mills. This mill will have an equipment of 10,000 spindles, which will be put in operation as soon as possible.

—*Texas, Belton. The directors of the Belton Cotton Mills, have decided to lay the corner stone of the mill, October 27. This company expects to have the mill in operation January 1st.

—*Texas, Corsicana. It is expected that the Corsicana Cotton Factory will be ready to start production of goods early in November.

—*Texas, Dallas. J. E. Wiley informs us that they propose building a complete cotton mill of 3000 spindles. Plans and specifications for the mill are now in the hands of a mill architect for estimates and necessary requisites for the complete equipment of the plant.

—*Texas, Fort Worth. Major J. J. Jarvis states that the efforts to raise the necessary money for the proposed cotton mill have only been temporarily suspended owing to the Galveston flood, and as soon as that matter is cleared up, work will be resumed on pushing the new enterprise.

—*Texas, Waxahachie. The building of the Waxahachie Cotton Mill is now ready for the roof. A large engine is now being installed, and as soon as roof is on, the operating machinery will be installed.

—*Texas, West. The main building of the West Cotton Mills will soon be ready for roofing. This concern was incorporated last March, with capital stock of $100,000, to manufacture coarse fabrics.

Enlargements and Improvements.

—Alabama, Anniston. About $5000 is being expended by the American Net & Twine Co. to enlarge the power plant and making other improvements to the mill.

—*Alabama, Eufaula. Ground has been broken by the Eufaula Cotton Mills for the new power house, which they are to erect. The building will be 40 by 41 feet, with capacity of holding four boilers of 250 h. p. each, although only two will be installed at first.

—*Alabama, Huntsville. Machinery is now being installed in the addition recently built for the Dallas Cotton Mills. It is expected that operations will be started in full Feb. 1st.

—*Georgia, Jackson. The machinery is now being installed in the large addition recently completed by the Pepperton Mills.

—*Georgia, Millen. The Millen Cotton Mills will equip the mills with an electric light plant. They also have contract for lighting the town.

—*Georgia, Tennille. The Tennille Cotton Mills will equip the mill with an electric plant for lighting buidings and grounds.

—*Georgia, West Point. The capacity of the Lanett Cotton Mills will be doubled, after the machinery has all been installed in the new addition reported by us in an earlier issue, is ready.

—*Maine, Augusta. The Edwards Manufacturing Company is now at work installing 600 new looms, to replace present ones in the mill.

—Massachusetts, Fall River. A large wooden storehouse, 100 by 110 feet, is now being erected at the Sanford Spinning Co.'s plant by the New England Cotton Yarn Co.

—*Massachusetts, Indian Orchard. The Indian Orchard Company, which has recently completed erection of a new mill, have now awarded contract for erection of a new boiler house. The new addition will be about 40 by 50 feet, large enough to accommodate four boilers.

—*Massachusetts, Milford. A number of new looms are to be installed in Wm. Lapworth & Sons' mill.

—New Hampshire, Hooksett. A new dye house is now under construction for the Hooksett Manufacturing Company, who are to do their own dyeing and bleaching in the future.

—*North Carolina, Charlotte. A new weave room, 210 by 160 feet, will be built for the Louise Mills. Contract for construction of same has been let to Ingram & Green.

—*North Carolina, East Durham. The Durham Cotton Manufacturing Company has under construction the erection of a building 100 by 100 feet, which will be used as a finishing and shipping department.

—*North Carolina, Shelby. The capacity of the Shelby Cotton Mills is to be increased. They will install 4000 additional spindles.

—South Carolina, Cateechee. The Norris Cotton Mills contemplate making extensive enlargements to the plant, of about 6000 spindles, with necessary looms, for making fine sheetings. They now operate 5840 spindles and 312 looms.

Mills Starting Up.

—*New Hampshire, Somersworth. The Great Falls Manufacturing Company have put a number of the looms in operation again.

—*South Carolina, Anderson. The Orr Cotton Mills, which contemplated getting into operation some time previous, but were delayed owing to non-arrival of machinery, have now commenced operations. This mill, of which James L. Orr

is president, and which manufactures sheetings and drills, is operated by electricity.

—*South Carolina, Columbia. The Olympia Cotton Mills contemplate having the plant in operation November 1st. This company will make wide print cloths.

—*Virginia, Norfolk. Operations will soon be started in the Cotton, Oil & Fibre Co.'s fibre mill at this place.

Mills Shutting Down.

—New York, Valatie. Operations have been suspended for an indefinite time in the Wild Manufacturing Co.'s plant.

—North Carolina, Burlington. The Lakeside Cotton Mills have been shut down. This is the outcome of a notice regarding the non-employment of union labor.

—*South Carolina, Rock Hill. The Crescent Cotton Mill, of which Capt. A. E. Smith was appointed temporary receiver, has been shut down, owing to uncertain condition of the cotton market.

—*Tennessee, Memphis. The Old Pioneer Cotton Mill, recently put in operation by the Memphis Cotton Spinning Co., has been closed down.

Woolen.

New Mills.

—*California, Eureka. It is expected that the Humboldt Bay Woolen Mill will be ready to start operations November 1st. The machinery is expected to arrive shortly and will be immediately set up.

—*Georgia, West Point. The Langley Manufacturing Co., of which E. Lang will be manager, expects to have the plant ready to start operations in November. They contemplate making Jacquard specialties. Machinery is now being installed in the building.

—Massachusetts, Franklin. The new mill erected at South Franklin, by Enoch Waite, who intended using same for a paper mill, has been leased by Daniel Pendergast, formerly with the Armour Felt Works, and at present, superintendent of the Byfield Felting Co., for manufacture of shoddy. It is expected that operations in the new plant will begin about Nov. 1st. Horse blankets will probably be made also. William Pendergast, will assist his brother and will have charge of the plant, Daniel Pendergast retaining his position with the Byfield Mill. The machinery is now being placed.

—*Massachusetts, Spencer. The new factory established at this place for making dress goods, homespuns, cheviots, etc., will be known as the Spencer Textile Company. The mill will be equipped with two sets of cards and 17 looms. Robert P. Grant will be superintendent. It is expected that the mill will be ready to commence production of goods, which will be sold direct, November 15.

—*Massachusetts, Webster. Work has been started on the foundations of the new yarn mill to be erected at this place for L. D. Perry. In addition to the main building, a picker house 30 by 40 feet and a boiler house 40 by 20 feet will be erected. As previously stated, he contemplates having the mill in operation January 1st.

—Missouri, Carthage. A site has been secured by F. M. McDaniel for erection of a new woolen mill. About $40,000 will be expended on the plant.

—New Jersey, Paterson. A new concern has recently been started in the Hamilton Mill, on Mill Street, manufacturing honeycomb worsted shawls. Four looms are being operated.

—*New York, Kingston. Negotiations are now being carried on with the Board of Trade relative to a carpet factory. This project was attempted some time ago, but there was no assured outcome of the affair. It is said that 1200 people will be employed.

—*New York, Yonkers. Work is being pushed to completion on the new carding, spinning and weaving mills under construction for the Alexander Smith & Sons Carpet Company.

—*Pennsylvania, Reedsville. A. R. Gibboney & Co., who are to rebuild their woolen mill previously destroyed by fire, expect to have the mill ready to begin production of goods about Jan. 1st, 1901. It will be a one set mill, with 8 looms.

—*Virginia, Winchester. The Virginia Woolen Company has awarded contract for erection of the mill buildings to James N. Darr. They will also erect a new dye house 60 by 45 feet, an engine and boiler house 40 by 30 feet, and a picker house 30 by 50 feet. Foundation of the main building is now being laid.

—*Wisconsin, Onalaska. The new woolen mill established at this place by E. Stickler and others, formerly at Galesville, will be operated under name of the Onalaska Woolen Manufacturing Company.

Enlargements and Improvements.

—*Connecticut, Rockville. The new mill of the American Mills Co. is partly occupied, considerable new machinery having been placed.

—*Georgia, Atlanta. The Atlanta Rug Mills, of which R. H. Jones is president, J. H. Johnson, vice-president and secretary, and James Harvey, superintendent, will start work this year on erection of a new mill.

—Georgia, Rossville. The Park Woolen Mills have been shut down temporarily for purpose of making general repairs to plant and machinery. Several new machines will also be installed.

—*Indiana, Mishawaka. Among the improvements now under way for the Mishawaka Mfg. Co., are the erection of two buildings; one five stories, being constructed on the south side of the South race, adjoining buildings on Spring Street and one, two stories, from this across the race to the building formerly occupied by the Indiana Paper Mill. Later, a two-story brick building will be erected to replace old buildings now located on Water Street.

—Massachusetts, Haverhill. The worsted suiting and trousering mill operated at this place by A. Roberts & Co., has leased the Balcom Mill, at Claremont, N. H., where business will be removed. They will operate the looms at the Balcom Mill in connection with those removed ,which will give a total of 43. Heretofore they have had part of the work done outside, but in the new quarters the entire work will be done. Mr. John Roberts will have charge of the mill.

—*Massachusetts, Lawrence. The Pacific Mills inform us that they are building an extension to their dyehouse on some new filled land, instead of erecting a new mill, as previously reported by us.

—Massachusetts, Maynard. It is reported that a two-story building is to be erected by the Assabet Mill for carbonizing purposes.

—*Massachusetts, Methuen. A new 75 h. p. engine has recently been installed in the yarn mill operated at this place by John W. Jowett. This plant, which was purchased from Wendall Bros. and greatly improved, is now in a first-class condition. Mill contains five sets of machinery and is lit by electricity.

—*Massachusetts, Pittsfield. The addition to the weave shed of the Pontoosuc Woolen Co.'s plant is completed.

—Massachusetts, Saugus. New looms are being installed in F. Scott & Son's mill. This concern manufactures fancy dress goods.

—New Hampshire, Bristol. An addition, 42 by 45 feet, to be equipped with finishing machinery, is now being erected for the Dodge-Davis Manufacturing Co.

—*New Hampshire, Keene. Work has now been started on installation of machinery in the Faulkner & Colony Manufacturing Co.'s plant, recently erected.

—New Hampshire, Penacook. The Dustin Island Woolen Mills are now erecting building for engine and dynamo for new electric light plant, which they are to install in the mills.

—New Jersey, Yardville. About $10,000 are now being expended on the Groveville Carpet Works for repairs. It is expected that the plant will soon be in operation.

—Ohio, Tiffin. The Tiffin Woolen Mills, Balbian Bros., proprietors, are to be enlarged. An addition, two stories high, is to be built to the mill. This will furnish employment for about 60 more people.

—*Pennsylvania, Clifton Heights. The Kent Mfg. Co. expects to have the new worsted mills in operation the last of November.

—Pennsylvania, Philadelphia. Watt & Brother, carpet manufacturers, on Howard St., are now removing their plant to new quarters at Trenton Ave. and Sargent St. They have purchased additional looms, which will now give them a total of 40.

—Pennsylvania, Philadelphia. John Scanlin & Sons, 3rd and Huntington Sts., dress goods manufacturers, are installing 52 new Knowles looms in the mill

—Rhode Island, Olneyville. An addition 100 by 35 feet, one story, is now under construction for the Earnscliffe Mill, of which Gulle & Waterhouse are proprietors. When completed, looms will be installed and the addition will be operated night and day.

—Tennessee, Knoxville. The Riverside Woolen Mills, owned and operated by W. T. Parham & Sons, and which are located in So. Knoxville, will have the output of the plant increased.

—*Vermont, Cavendish. Gay Brothers Company, whose new mill is now under construction, expect to have same in operation in November. Part of the machinery from the old mill will be moved into the new one, and with the addition of 2 new sets and 10 looms, they will have a total of five sets of woolen cards and 62 looms. Meltons and fancy grade satinets are made by the company.

Mills Starting Up.

—*Massachusetts, Northboro. The finishing room of the Woodside Mills has been put in operation after a shut down since August.

—Massachusetts, North Dana. Crawford and Tyler's mill, which has been shut down for some time for necessary repairs, has been put in operation.

—*Pennsylvania, Tunkhannock. Operations have been resumed in the Winola Worsted Yarn Co.'s plant. During the shut-down, general repairs were made to the plant. A steam heating system was also installed.

—Pennsylvania, Upland. Walworth & Sons, shoddy manufacturers, whose plant has been closed to allow repairs to be made, have resumed operations.

—*Tennessee, Chattanooga. Operations have been started in the Wool Extract & Merino Company's new plant, at 103 Market Street. This concern has a capital stock of $5000. Harry Sheard holds position of superintendent. Wool and merino shoddies are to be made.

—Virginia, Petersburg. The mills of the Blue Ridge Mfg. Co. have been shut down.

Mills Shutting Down.

—Massachusetts, Bemis. The Bemis Mills, which have been making worsted fabrics, are to close down indefinitely, and the overseers are getting through. This mill is owned by R. A. Goodwin, of Augusta, Me., who states that he has no immediate intention of starting it up again.

—Massachusetts, Newton. The Nonantum Worsted Mills, which have been running a small portion of their machinery off and on during the summer, are, we understand, closed down entirely for an indefinite period.

—Massachusetts, Uxbridge. Preparations are now being made to shut down the Calumet and Hecla Mills. It is not known how long the mills will be closed.

—Massachusetts, Warren. The Bradford Yarn Mills, James E. Miller, superintendent, have been shut down.

—Missouri, St. Joseph. The Buell Woolen Mills have been shut down for about four weeks for purpose of making repairs to the plant.

—New Hampshire, Troy. The old mill of the Troy Blanket Mills has been shut down for about three weeks, making necessary repairs.

—Rhode Island, Pascoag. A. L. Sayles & Sons, manufacturers of woolens and worsteds for men's wear, have shut down the mill for an indefinite time.

Knit.

New Mills.

—*Alabama, Talladega. The Talladega Hosiery Mills, which we previously reported incorporated with capital stock of $8000 P. S. Williams, president, and W. T. Billue, treasurer, will make hosiery, 108 or 136 needle goods. The plant will have a capacity of 150 dozen per day. Will have about 25 knitting machines. Machinery contracts are to be placed Nov. 1st. It is expected that the mill will be ready to start operations by Jan. 1st. Company is yet undecided about erecting a dye house.

—*Georgia, Fort Valley. We have now been informed by J. M. Jones, president, that a company has been formed, but not yet incorporated, to operate a knitting mill here for manufacturing ladies' underwear. The will will be equipped with 10 knitting machines and operated by steam. It is expected that operations will be started Jan. 1st. Has a paid in capital of $10,000.

—*Georgia, Waycross. The new knitting mill at this place, for manufacturing jersey ribbed underwear, will be equipped with 40 knitting machines and operated by steam. A dye house will be attached. Company, of which Geo. R. Youmans is president, J. S. Bailey, treasurer, and Geo. T. Woodin, Jr. (Newport, N. Y.), general manager, is capitalized at $30,000. Goods will be sold direct. They are in the market for considerable machinery. Mr. Woodin is to be addressed at Newport, N. Y., until Dec. 15th.

—Maryland, Salisbury. The Salisbury Knitting Company has been organized with Dr. Samuel A. Graham president of the Board of Directors. It is said that the plant will furnish employment for about 25 people.

—Michigan, Adrian. The citizens of this place have raised a bonus to secure a knitting factory, which will furnish employment for about 100 people. The plant will be located in building to be vacated by the Perfection Tooth Pick Co. It is expected that operations will begin about Jan. 1st.

—*New Jersey, Bridgeton. In regard to the projected knitting mill at this place, in which Thomas P. Eltonhead, Thomas S. Hoff and Geo. S. Wilson are interested, it is now learned that they have decided not to purchase the old paper mill building, but that it would be to better advantage if a lot were purchased and a new building erected. No definite decision has as yet been reached. They intend manufacturing men's, women's and children's underwear.

—*New York, Oneida. The Oneida Hosiery Company has been incorporated with capital stock of $20,000, with Willard J. Frisbie president; George A. Frisbie, treasurer; Jesse F. Burton, agent and C. H. Oakes, secretary. Operations will be started November 1st., making seamless hosiery. Mill will have equipment of 80 machines. Dyehouse will be attached. This was mentioned in a previous issue under Utica, by error.

—North Carolina, Littleton. A new company has recently been formed here with S. Johnson, president; W. L. Powell, vice-president and L. Vinson, secretary and treasurer, to erect and operate a knitting mill. The capital stock is $50,000. Orders are to be placed at an early date for machinery and other equipment.

—*North Carolina, Raleigh. The machinery will soon be installed in the Melrose Knitting Mill and operations started as soon as possible. This plant will manufacture underwear and will have a capacity of 300 dozen garments per day. L. H. Royster is superintendent and Frank Ward secretary of the new concern.

—*Pennsylvania, Avon. Sam'l L. Light is president; Stephen A. Light, treasurer and T. G. Spangler, secretary and superintendent of the Lebanon Textile Company, recently incorporated with capital stock of $30,000 to operate the Avon Knitting Co.'s plant. The plant, which manufacturers ladies' ribbed cotton goods, has a total equipment now of 22 knitting machines.

—Pennsylvania, Reading. A branch mill, for making half hose, is being established at this place by the Park Hosiery Company of Pottstown.

—*Tennessee, Chattanooga. The machinery is now being installed in the Chicama uga Knitting Mills' plant.

—*Tennessee, Knoxville. The new knitting mill at this place in which J. T. Brownlee is interested, and about which we have given details in previous issues, is called the Standard Knitting Mills. They will break ground Oct. 15th and expect to start up March 1st. 1901.

—Virginia, Lambert's Point. The Clifton Hosiery Mills Company is a new corporation which will establish a mill for making ladies' hosiery at this place. The capital stock of the concern, of which G. W. Cloughenour is president, and J. Wilcox Jenkins, secretary and treasurer, is $25,000. Work will be started at an early date on erection of a two-story brick building. Employment will be given to about 125 people.

—*Virginia, Lynchburg. The Lynchburg Hosiery Company has been incorporated with a capital stock of $10,000; J. G. Burton, president and superintendent and R. M. Patton, treasurer. They will manufacture ladies and men's hose and half hose, starting operations about December 1st, 1900. Plant, which will be run by steam power, will have equipment of 50 knitting machines. A dye house will also be attached. Goods will be sold direct. Are in the market for all necessary equipment.

—*Virginia, Williamsburg. The new mill for the Williamsburg Knitting Mills Co has been completed. The main build-

ing is 125 feet long, two stories high. The last of the machinery is now being installed and the plant will be ready to start operations in about a week or so. This company will make fleece-lined underwear.

—*Wisconsin, Appleton. The Fox River Valley Knitting Co., is the name taken by company recently incorporated with capital stock of $8000, to manufacture hosiery and knit goods. This is the concern in which John Steinburg is interested.

Enlargements and Improvements.

—*Iowa, Des Moines. The Iowa Knitting Company have moved into their new quarters, the Tabernacle property. The plant now has a capacity of 300 dozen pairs of hose per day. A new dye plant has also been established.

—Massachusetts, Needham. William H. Wye & Co., who succeeded Wye Bros. & Co., let contract on the 10th for a new building on Highland Ave., and are putting in a line of machinery for athletic goods, and are in the market for shafting, pulleys, etc. They will run the plant by electricity. Sell direct.

—Michigan, Muskegon. An addition, 16 by 175 feet, is to be built to the Amazon Knitting Co.'s mill. This concern makes hosiery, gloves, mittens and underwear.

—Michigan, Quincy. The Quincy Knitting Company has increased the capital stock to $25,000.

—New Hampshire, Lakeport. Henry Clow, of William Clow & Son, has purchased the machinery in O'Shea Bros.' hosiery mill, and is installing it in the Bayside mill, into which they moved last spring.

—New York, Phoenix Mills. An addition, 40 by 100 feet, 2 stories high, is to be built for the Index Knitting Mill. The new addition will be used for a dry house and press room.

—*New York, Rome. An addition, 73 by 40 feet, 2 stories, to be used at present for store room, but later for manufacturing, is under construction for the Fort Stanwix Knitting Company, recently incorporated with capital stock of $30,000. Men's plain and fancy balbriggan underwear is manufactured. Plant is equipped with 14 knitting machines, operated by steam, and also dye house. Goods are sold through Bacon & Co.

—*New York, Syracuse. The Oak Knitting Company, which is now erecting an addition to their mill, and which manufactures ladies' and misses' ribbed underwear, are in the market for knitting machine cylinders and automatic sprinklers. The company operates 60 knitting machines.

—New York, Troy. A dynamo for lighting purposes is to be installed in the Troy Knitting Co.'s plant.

—*New York, Utica. Nearly all of the machinery in the new mills of the Utica Knitting Company's plant is in operation.

—North Carolina, Raleigh. The Willardville Hosiery Co., manufacturers of ladies' and men's hose, has replaced about half the former machinery with that for making fine goods.

—*Pennsylvania, Bath. When the new addition, which we previously reported to be made to Odenwelder & Co.'s knitting mill is completed, the mill will have a total of 100 machines. They are in the market for various essentials in an addition to a hosiery plant.

—*Pennsylvania, Elizabethville. An addition is being built to the Enterprise Hosiery Mills.

—Pennsylvania, Troy. A dynamo, for lighting purposes, is now being installed in the Troy Knitting Co.'s mill.

—*Virginia, Lynchburg. The Midland Hosiery Company, capitalized at $50,000, and of which George R. McAuslan is treasurer; Fred Moore, agent; O. Nestler, manager, will install 30 new knitting machines in new addition now being erected. This company manufactures all kinds of hosiery, specialty being worsted and merino, children's, misses' and men's hose. A dyehouse is attached to the mill, which will have a total number of 185 machines when annex is in operation.

—*Virginia, Newport News. A. H. & W. E. Cobb, who recently started some machines in operation here manufacturing half hose, with view to erecting a large mill, are now removing the same to their mill in Suffolk, owing to inability to secure necessary labor.

Mills Starting Up.

—*Pennsylvania, Reading. Operations will soon be resumed in the Monarch Knitting Mills, W. C. Shantz, formerly proprietor, under management of Richard Parker, of Philadelphia. The plant, sold at a trustee's sale, netted $5385. J. B. Fricker and Daniel Raab are associated with Mr. Parker.

—*Texas, Denison. Operations have been started in the Gate City Hosiery Mills, of which W. A. Tibbs is president; C. A. Dupuy, vice-president and manager; H. Brooks, treasurer and F. J. Dupuy, secretary.

Mills Shutting Down.

—Pennsylvania, Pottstown. The branch mill of the Norristown Hosiery Company is to be shut down and machinery removed to the main mill at Norristown.

—Pennsylvania, Riegelsville. The Clymer Knitting Mills, Lee S. Clymer, proprietor, manufacturing women's underwear, have been shut down indefinitely.

Silk.

New Mills.

—*Maine, Westbrook. The Haskell Silk Company expects to be ready to start operations in their new mill Nov. 1st.

—New Jersey, Paterson. A new concern, The Commercial Silk Mfg. Co., has recently been started at 93 River Street, manufacturing broad silks. Plant is equipped with 8 broad looms. Product is sold direct.

—New Jersey, Paterson. The Star Silk Co. is now operating a plant in the Hamilton Mill, manufacturing taffetas, with 14 looms. This concern was formerly known as Sapirstein & Garfenkel, with whom Mr. A. Bach is now associated. Goods are sold direct.

—*New York, Phoenix. Duffy Bros. & Nellis, whom we reported removing their plant at Port Jervis to this place, inform us that they will continue operating mill at Fort Plain, in connection with mill at new location. They will start plant on silk throwing, Nov. 1st.

—*Pennsylvania, Carbondale. Work is progressing rapidly on the new silk weaving mill under construction for the Empire Silk Manufacturing Co.

—*Pennsylvania, Hazleton. It is expected that the Duplan Silk Mill will be ready to start operations in about two weeks. The looms, numbering about 500, are now being installed.

—*Pennsylvania, Hazelton. The Monopole Weaving Company, whose new plant at West Hazelton is now under construction, expect to have the plant ready to start manufacturing, December 1st, 1900. They will employ from 125 to 150 people, making satin linings.

—*Pennsylvania, Meadville. The Banner Silk Co., of Paterson, N. J., who are building a branch plant at this place, expect to have the same in operation by January 1st, 1901. The mill will have an equipment of 50 looms for manufacturing broad silks. Electricity will be power used.

Enlargements and Improvements.

—*Connecticut, Stonington. Several new looms have recently been installed in the addition recently completed for the American Velvet Mill.

—Pennsylvania, Scranton. An addition, 86 by 46 feet, 3 stories high, for which contract has been let, is to be built to Reiling, David & Schoen's silk factory here. The new building will cost about $10,500 and will be ready to begin operations in about a month.

—*Virginia, Norfolk. The Norfolk Silk Company will install 100 new looms and other additional machinery in the plant. As soon as the looms are installed, they will be put in operation. Employment will be furnished for about 100 more people.

Mills Starting Up.

—*Massachusetts, Milford. Operations have been started in the Magid-Hope Silk Manufacturing Co.'s plant, a force of 75 men now being employed. Several of the men are working in all the departments of the plant. This company has a capital stock of $500,000, with Louis B. Magid, president and general manager; William E. Stowe, Jr., treasurer, and H. E. McKerrow, secretary.

—*New Jersey, Phillipsburg. Operations have been resumed in Ashley & Shaw's silk throwing mill, after a shut down of two months.

—*New York, Sidney. The Sidney Silk Mills, which we recently reported to be operated by the Clark Textile Company, have been put in operation on a small scale. It is thought that the entire working force will be employed by the middle of October.

Mills Shutting Down.

—New York, Watertown. The plant of the Elmwood Silk Manufacturing Company, B. H. Elwood, president, which is in financial difficulties, has been shut down indefinitely. It is thought that the company will be re-organized and the plant again started on a paying basis.

—*Pennsylvania, Hallstead. The plant of the Hallstead Textile Company is now idle. It is not definite how long the shut down will last.

Miscellaneous.

New Mills.

—*California, Oakland. The California Flax Mills, of which John Rutherford is superintendent, have started work on foundation of their new building. The mill will be equipped with all the latest improved machinery. B. Ettlinger is president and J. Y. Miller of the company, which now has its offices at 310 California St., San Francisco. Work will be pushed as rapidly as possible toward completion.

—*Georgia, Augusta. Work will soon be started on superstructure of the Clear Water Bleaching and Manufacturing Co.'s plant. The main building will be 33 by 76 feet, with two wings, 225 by 83 feet and 196 by 51 feet. A separate dye house, 91 by 63 feet, will also be built. The capacity of the plant will be 8,000,000 yards of goods per week, of which 3,000,000 can also be printed. Thomas Barrett, Jr., is president of the company. It is hoped to have the plant in operation May 1st.

—Indiana, New Albany. The Hoosier Dyeworks & Mfg. Co. has been organized by C. W. McCord and A. E. Wright as a branch of their main mill at Louisville, Ky. Warps and yarns will be colored by the new company.

—New Jersey, Camden. R. H. Comey, who operates a large bleachery in South Camden, has purchased a lot of land, on which he will erect a new building, 150 by 150 feet.

—*New Jersey, Paterson. The Magrath, Ammann & Arnold Co., started operations Oct. 1st, at 58-62 Garfield Ave., in the skein silk dyeing business. This company has a capital stock of $50,000. Frank Arnold is president; Francis G. Magrath, treasurer and agent, and Emil Ammann, vice-president.

—Pennsylvania, Philadelphia. The Fidelity Finishing Works is a new concern recently started at Mascher and Turner Streets, for operating a plant finishing all kinds of fabrics. Wm. C. Melcher is proprietor and manager. They have rented the entire lower floor of the Dolan Mill and equipped it with new finishing machinery.

Fires.

—Indiana, New Albany. The New Albany Woolen & Cotton Fibre Company's plant has been destroyed by fire, with a loss of $10,000; that on machinery being placed at $7500 and the building, $2500. No insurance. Company made shoddies of all descriptions, and also did custom carding, picking, etc.

—Massachusetts, Hebronville. The upper portion of the Hebron Mfg. Co.'s boiler house was destroyed by fire, causing loss of about $2500.

—New York, Auburn. The wool house of the Melrose Woolen Company's plant was destroyed by fire the 3d inst. Loss is estimated at about $40,000. The contents of the building, including a large quantity of wool, blankets, several thousands of raw material and some machinery, were also a loss.

—Pennsylvania, Philadelphia. The Red Star Dye Works, operated by J. W. Carson, at Wingohocking Creek and Bristol Streets, have been recently damaged by fire with a loss of about $20,000.

—Pennsylvania, Philadelphia. The chemical department of Sutro & Sons' Dye Works, Edgemont St., was damaged by fire and explosions. The loss is estimated at about $4500, partially covered by insurance.

—Virginia, Winchester. The steam dyeing and cleaning works at this place, of which Harry Parsons is proprietor, were badly damaged by fire recently. They will be ready to resume business in a few days.

Failures and Suspensions.

—New Jersey, Paterson. The Close & Burke Silk Dyeing Company has assigned to William D. Blauvelt, cashier of the Second National Bank and the plant shut down. The liabilities are estimated at about $12,900 and the assets are rated at $2,000.

Facts and Gossip.

—Alabama, Birmingham. W. E. Williams, of 509 Nineteenth St., North, contemplates establishing a plant for manufacture of hosiery and is now receiving estimates and prices on equipment for cotton hosiery.

—*Alabama, Gadsden. A company is now being formed with capital stock of $100,000 to erect a plant for manufacturing yarn. It is proposed to equip the mill with 5000 spindles. O. R. Goldman of the Queen City Bank is interested. About $40,000 has already been subscribed by the people in Gadsden. The project was mentioned some time ago, but nothing was done.

—*Alabama, Livingston. J. L. Horn informs us that since making investigations regarding proposed cotton rope factory, that the idea has been abandoned, owing to cost exceeding calculations.

—*Alabama, Scottsboro. The question of a cotton mill is again being agitated at this place and it now seems to be assured. Site has already been purchased and work will now start on soliciting subscriptions. S. S. Broadus, cashier of the Merchants' Bank at Florence, is interested in the project.

—Alabama, Tuscaloosa. The Tuscaloosa Wadding Mill, which has been idle since last May, since it was purchased and dismantled by the wadding combination, has been purchased by D. L. Rosenau and associates, who expect to put it in operation at an early date. It has not yet been definitely decided what kind of a plant will be installed, although some mention is made of manufacturing hosiery.

—*Arkansas, Dardanelle. The Dardanelle Cotton Mills are now being operated on full time with about one-third the full complement of help, owing to scarcity of skilled operators.

—Arkansas, Hope. Capt. Bridewell is interested in project of company being incorporated with capital stock of $100,000 to build and equip a cotton mill.

—Arkansas, Osceola. Efforts are being made to organize a company here for purpose of erecting and operating a cotton factory.

—*California, Sunolglen. We now learn that the mill which we reported in August was being built by C. L. Torr, will not be put in operation, the project having been abandoned.

—Canada, N. W. T. Medicine Hat. The Western Canada Woolen Mill Company has been formed to build and operate a plant at this place.

—*Connecticut, Dayville. James Legg has been recommended for a discharge in bankruptcy by Referee Newton. Mr. Legg was formerly owner of the Yukon Woolen Mills, which were in financial difficulties Feb. '99. By sale of the property a dividend of 24 per cent. was paid the creditors on their claims.

—Connecticut, Newington. C. W. Crane has purchased the small knitting mill formerly operated by John Chapman. It is reported that he will increase the machinery and manufacture cardigans, hosiery, gloves, etc.

—*Connecticut, Norwich. It is reported that there is a possibility of the Otrobando Woolen Company being reorganized, new capital added and the mill again put in operation. A. W. Sholes has recently been appointed receiver for purpose of winding up the company's affairs.

—*Connecticut, Oneco. The water privilege, ten houses, office building and land on which the mill stood, previous to destruction by fire of the Oneco Manufacturing Co., has been purchased by Clark Whitford. It is reported that efforts will be made to have another mill built.

—Delaware, Dover. The P. M. Silcock Company of New York has been been incorporated with a capital stock of $25,000. The concern will manufacture and sell cotton goods.

—Florida, Pensacola. Correspondence is now being carried on with J. R. Keller, vice-president of the Young Men's Business League, regarding the establishment of a cotton mill here.

—Georgia, Cedartown. The big waste house at No. 1 mill of the Cedartown Cotton Co., recently destroyed by fire, will be rebuilt. The loss on the property was covered by insurance.

—*Georgia, Felton. A. J. Estes informs us that he has been getting estimates on knitting machines, etc., with a view of probably installing one or two in his grist mill, but not that he contemplates erecting a knitting mill.

—Georgia, Gordon. Efforts are now being made for the erection of a cotton factory at this place.

—Georgia, Thomaston. Robert Hightower, general agent of the Macon & Birmingham Railroad, with headquarters at Thomaston, is interested in securing a cotton mill at this place.

—Georgia, Thomson. It is reported that J. E. Clatt, who has purchased the oil mill building at this place, contemplates remodelling the same and equipping it to be operated as a knitting mill.

—Georgia, Thomson. It is rumored that a project is now on foot for the erection of another cotton mill, with capacity of about 3000 spindles.

—*Illinois, Alton. Piasa Woolen Mill, which we previously reported had been sold, will now be operated by a new concern in manufacture of shoes.

—Illinois, Chicago. The Calumet Woolen Company has been incorporated with a capital stock of $50,000. Leo Polachek, Leo Strauss and Mark H. Harris are the incorporators.

—Iowa, Fort Madison. Subscriptions are now being solicited for a knitting factory at this place.

—Louisiana, Minden. A movement is now on foot for erection of a cotton mill at this place.

—Maine, Bangor. The Bangor Dyeing Co. has been incorporated with capital stock of $10,000. Among the incorporators are F. O. and Susan R. Buzzell.

—Maine, Springvale. Messrs. Lowe and Schofield have purchased F. R. Bean's interest in the Springvale Woolen Company. At a meeting recently held by the stockholders, C. M. Abbott was elected president and C. W. Lowe, treasurer. The mill will soon start running on double time.

—Maryland, Elkton. A large lot of land has been purchased by Delbert & Wilson, upon which they contemplate erecting a textile factory.

—Maryland, Franklinville. The firm of A. A. Blakeney & Co., cotton duck manufacturers, composed of Andrew Jones and A. A. Blakeney, has been dissolved by mutual consent.

—*Massachusetts, Auburn. It is reported that the Auburn Worsted Mill, which has been idle for some time, and which has an equipment of 5 sets, will soon be put in operation. The mill has been under care of Wilkinson Crossley and but few repairs will be needed to the machinery.

—*Massachusetts, East Blackstone. George Girard of this city has purchased the mill and machinery of the Blackstone Spinning & Dyeing Company at a mortgagee's sale, recently held by Auctioneer James W. Daly. The plant, which has been idle of late, was last operated by F. J. Gobeille.

—Massachusetts, Fall River. There is now talk of a new mill for the manufacture of fine yarns to be erected at this place. This has been under consideration for some time, but is now brought forward since the New England Cotton Yarn Co. have sent out notice that their goods will hereafter be sold direct. Edward B. Jennings, formerly with the Globe Mills, is mentioned at the head of the enterprise. There is also a project under promotion by S. B. Ashley, formerly with the Barnaby Mfg. Co., for a mill for manufacturing ginghams and fine goods.

—Massachusetts, Fall River. It is reported that the erection of another mill is contemplated on the Iron Works property by M. C. D. Borden.

Massachusetts, Fall River. At the annual meeting of the stockholders of the Laurel Lake Mills, recently held, Abbott E. Slade was elected treasurer, succeeding Edward L. Anthony.

—Massachusetts, Fall River. Part of the dyeing department of the Kerr Thread Mill, which has been running overtime of late, will be shut down for a couple of months.

—Massachusetts, Fall River. John S. Brayton was elected president and W. Frank Shove, treasurer, of the Fall River Manufactory, at a recent meeting of the stockholders.

—Massachusetts, Fall River. At a recent meeting of the stockholders of the Union Manufacturing Company, Edward L. Anthony was elected president and Thomas E. Brayton, treasurer.

—*Massachusetts, Farnumsville. The Farnumsville Cotton Mill property, including the mill, water privilege, land and 30 tenement houses, has been secured by the Woonsocket Institution for Savings for $12,000 at a foreclosure sale of a mortgage for $50,000, held by the named bank.

—*Massachusetts, Holyoke. The Supreme Judicial Court has been petitioned by the stockholders of the Chadwick Plush Company for a dissolution of the concern. Company has ceased business and is without indebtedness.

—*Massachusetts, Mendon. It is reported that Mrs. Hannah Swan contemplates rebuilding the flock mill, which was destroyed by fire a few months ago.

—*Massachusetts, Milford. The Magid-Hope Silk Company, which has an office at 22 Broad Street, Boston, wil open one at 308 Silk Exchange, New York, November 1st.

—*Massachusetts, Millbury. It is reported that The Worcester & Blackstone Valley Street Railway Company have leased the Millbury Cotton Mills, long idle, to be used as a power house.

—Massachusetts, Monson. Edward D. Cushman has retired from the firm of S. F. Cushman & Sons. Rufus P. Cushman, who has not taken an active part in the

business, which will continue running under old name, will act as president; S. Fred Cushman, manager; T. L. Cushman, treasurer, and Robert H. Cushman, secretary.

—Massachusetts, Norfolk. The City Mills, of the American Felt Co., have been shut down, with the exception of one room, for the winter.

—Massachusetts, Ware. The carding and spinning rooms of the woolen department of the Geo. H. Gilbert's No. 4 mill have been shut down, for purpose of filling that mill with worsted machinery. The woolen machinery will be removed to the No. 1 mill.

—Massachusetts, Westford. The Abbott Worsted Company has been incorporated with a capital stock of $600,000, with J. A. Cameron, president, and A. J. Abbott, treasurer. This company will operate plant of Abbott & Co., Graniteville.

—Massachusetts, Worcester. The American Star Thread Co. has been incorporated at Portland, Maine, with capital stock of $1,000,000. B. F. Allen (Groton, Conn.), is president; J. Myron Weaver (Fall River), treasurer; Charles J. O'Hara (Worcester), secretary. Fine threads will be manufactured.

—Mexico, Managua, Nicaragua. Senor Pedro Maas, of Mexico, has been granted the exclusive right for five years to manufacture cotton articles with English machinery. Cotton is to be imported into Nicaragua, free of duty.

—Michigan, Saginaw. Efforts are now being made by this place to secure the linen mill in which W. J. Thompson, of Albany, is interested. It is proposed that plant be capitalized at $60,000, a large portion of which must be taken by the city.

—*Mississippi, Jackson. Efforts are now being made to organize a company with capital stock of $100,000, to erect a cotton factory. They desire to have a plant with capacity of 5000 spindles and necessary looms.

—Mississippi, Waveland. The Hancock County Mills have been incorporated by H. S. Weston and others, to manufacture cotton and woolen goods. The capital stock is $50,000.

—New Hampshire, Guild. The Granite State Mills, owned by Fairbanks & Dorr and equipped with 5 sets cards and 48 looms, are being operated night and day.

—New Hampshire, Hooksett. At a recent meeting of the directors of the Hooksett Manufacturing Company, M. U. Adams was elected president and H. D. Bourne, treasurer.

—New Hampshire, Nashua. William D. Cadwell has resigned as agent of the Jackson Manufacturing Company. His son, William H. Cadwell, has succeeded him.

—New Jersey, Bridgeton. It is reported that negotiations are now being carried on relative to establishing a silk mill at this place.

—*New Jersey, East Orange. At a meeting recently held at this place by the United States Finishing Company, which succeeded Norwich Bleaching, Dyeing and Printing Company, Norwich, Conn., the Dunnell Company of Pawtucket, R. I., and the Reid & Barry Company of Passaic, N. J., Joseph H. Wright was elected president and general manager; J. Hunt Smith, vice-president and treasurer, and J. Millar, secretary. Work is progressing on erection of the large addition to the plant at Norwich, Conn.

—New Jersey, New Brunswick. It is reported that a carpet company is now considering the project of establishing a factory at this place, and that it is thought that the Turn Hall will be purchased and rebuilt for that purpose.

—New Jersey, Passaic. It is reported that negotiations are now being carried on by Justice Richmond and Thomas Dutton with a New York concern regarding purchase of property upon which to erect a carpet mill. It is said that the company will erect a building at a cost of about $7000, and will install about $5000 worth of machinery.

—New Jersey, Paterson. The Lockman Bros. Silk Company has been incorporated with a capital stock of $100,000, $20,000 paid in. Silk and cotton goods of all descriptions will be manufactured. Company, of which Joseph Lockman is agent, has office at 64 Ryle Ave. The other incorporators are William, Joseph and Nelson Lockman. This is probably an organization to operate plant formerly run by Mr. Lockman in the Addy Mill.

—*New Jersey, Paterson. The creditors of James E. Daly held a meeting before John W. Harding, referee in bankruptcy, on October 13th.

—*New York, Cohoes. John Horrocks, whom we reported had purchased the Lion Knitting Mill, formerly operated by C. Craig, informs us that he does not intend to operate it, but has it for sale.

—*New York, Dryden. Geo. Cole has purchased the Dryden Woolen Mill property and contemplates making arrangements for putting it in operation. Mr. Lull, formerly proprietor of mill at Brockton, is also interested.

—New York, Frankfort. A meeting has been recently held by the stockholders of the Frankfort Linen Mfg. Co. relative to making an effort to reopen the linen mill, which has been closed for about three months. Henry Churchill is president and treasurer of the concern.

—*New York, Unionville. Samuel Thorpe has been appointed trustee for Toner & Prescott, silk manufacturers, recently reported in financial difficulties.

—*New York, Utica. The Utica Knitting Company has decided to increase the capital stock from $550,000 to $750,000. The increase will be to carry on the business and not for any additions to be made.

—*New York, Watertown. Robert Lansing has been appointed receiver for the Ellwood Silk Company, recently reported in financial difficulties. The assets of the concern are estimated at about $112,280.64, with liabilities of $83,132.23. The mill has been shut down.

—North Carolina, Charlotte. J. E. Beirch, president and treasurer of the Gaffney Carpet Mfg. Co., Gaffney, S. C., has been looking at sites here with a view to establishing a branch mill. Nothing definite has yet been decided upon.

—North Carolina, Cherryville. It is reported that Messrs. Aduholt & Rudisill, of the Vivian Cotton Mills, are negotiating for a water power near Hildebrand, where they contemplate erecting another cotton mill.

—North Carolina, Concord. J. C. Wadsworth and B. C. Harris have recently purchased land near this place, upon which they contemplate erecting a cotton mill. A stock company will be formed for the purpose.

—North Carolina, Graham. Work is running slack in the Oneida Mills, only about 40 looms now being run.

—North Carolina, Louisburg. J. W. Hollingsworth is interested in a movement now on foot for the establishment of a cotton mill at this place.

—North Carolina, Raleigh. New York capitalists, who are interested in various silk plants, will establish a branch mill at this place, if satisfactory arrangements are made. The Chamber of Commerce is interested in the project.

—*North Carolina, Raleigh. Report concerning establishment of another mill for manufacturing ladies' underwear seems to be without foundation.

—*North Carolina, Shelby. H. F. and J. F. Schenk, with J. G. Morrison, have purchased the Stices' Shoals, and will organize a company with capital stock of $100,000, to erect a cotton mill. Nothing will probably be done, however, until after election.

—North Carolina, Tryon. The Tryon Hosiery Company has now been chartered with capital stock of $50,000. L. N., F. S. and E. C. Wilcox are the incorporators.

—Ohio, Maumee. A rumor is now in circulation that the site of the old cotton mill is to be purchased by a syndicate which contemplates erecting a new mill.

—Ohio, Piqua. The charter of the F. Gray Co. will soon expire by a limitation contained in the articles of the association, and the stockholders held a meeting to prepare plans for reorganization before the right expires and keep the plant in steady operation. They propose organizing a new company with capital stock of $200,000.

—Ontario, Campbellford. There are rumors about a new wooen mill, to be equipped with ten sets of machinery, to be erected here.

—Oregon, LaGrande. It is reported that the Commercial Club is interested in the erection of a woolen mill and will try to raise $12,000 for the enterprise. They have already secured $4000.

—*Pennsylvania, Kutztown. The Kutztown Silk Throwing Mills, A. R. Morrison, formerly proprietor and manager, are now controlled by Hartley Bros.

—Pennsylvania, Mohrsville. It is reported that another new knitting mill will be started up at this place.

—Pennsylvania, Philadelphia. A meeting was recently held by the creditors of James Martin & Co., dyers and finishers. Judgments have recently been entered against the firm for $50,000. The last statement of the company, January 1st, showed assets of $570,000 and liabilities of $197,000.

—Pennsylvania, Philadelphia. An attachment for $12,079 has been granted against Thomas J. Hatfield, manufacturer of cotton and woolen dress goods and men's wear, Ripka Mills, Manayunk, in favor of Wendt, Steinhauser & Co. The attachment which was granted on grounds of non-residence, was served on a dry goods commission merchant.

—Pennsylvania, Philadelphia. A petition of involuntary bankruptcy has been filed against Thomas Jaggers, cotton and woolen yarns, Allegheny Avenue and Emerald Street. The petitioning creditors are: Henry Dodgson, Camden, N. J., for $454.69; O'Neill Bros., Philadelphia, $536.47 and Thomas Crompton (Phila.), $781.35.

—Pennsylvania, Philadelphia. Geo. E. Lackey, selling agent for the Bromley Manufacturing Company, Lehigh Ave. below Front St., has resigned his position, to take place on or before Dec. 1st, and will start in the manufacture of lace curtains. Location has not yet been decided upon.

—*Pennsylvania, Selin's Grove. W. B. Nipple informs us that as yet he cannot say anything definite regarding the rebuilding and putting in operation his mill recently destroyed by fire.

—Pennsylvania, Sunbury. A silk printing and dyeing concern, now at New York City, is to remove the plant to this place. A building has been leased and in addition two new ones, 100 by 150 feet and 30 by 40 feet, respectively, are to be erected. The company will furnish $35,000 and Sunbury $5000.

—*Pennsylvania, Williamsport. The Royal Braid Company, R. Weir Gibson, manager, will soon be ready to resume operations. Negotiations are now under way for lease of space in building on Locust Street.

—P. Q., Sherbrooke. An English syndicate has secured the Dominion Brussels Carpet Co.'s plant, and are operating it under name of The Dominion Carpet Company, Ltd. E. W. Randle is the secretary. Among the other directors are: C. S. Cox, W. R. Harman, G. M. Smith and W. M. Phillip.

—Rhode Island, Bridgeton. The Bridgeton Worsted Company has been re-organized, Robert Wilcox (Pascoag), and William Lacey (Nasonville), becoming general partners, and Olney T. Inman, a special partner. This company manufactures woolen and worsted goods.

—Rhode Island, Pawtucket. At a recent meeting of the directors of the American Hair Cloth Company, Henry B. Metcalf was chosen treasurer, filling vacancy made by death of Gen. Olney Arnold.

—Rhode Island, Pawtucket. The Green Mountain Braiding Company has been incorporated with capital stock of $50,000. They will manufacture yarns, braids, etc. T. A. Pingree, W. Ball, Sr., J. E. Ball, W. Ball, Jr. (Lonsdale), C. E. Allen (Centrall Falls), and G. I. Parker (Pawtucket), are among the incorporators.

—Rhode Island, Providence. Harold S. Lawton has resigned as president and manager of the Lawton Spinning Company, which also operates a mill in Woonsocket. F. C. Fletcher, vice-president, is now acting president, until the next annual meeting takes place, when new officer will be elected.

—South Carolina, Tabernacle. Robert W. McMillan, operating a general store at this place, contemplates establishing a knitting plant, although he has as yet made no definite plans.

—South Carolina, Red Bluff. The Octoraro Mills Co. has been incorporated, with capital stock of $30,000. The incorporators are: B. G. and C. W. Worth (Wilmington, N. C.), and C. A. Woods (Marion, S. C.)

—South Carolina, Columbia. The Mutual Carpet Company has been incorporated with capital stock of $15,000. It is reported that they contemplate erecting a building for manufacturing carpets and rugs.

PERSONAL RECORD.

Cotton.

—John A. McCall, president of the New York Life Insurance Co., at a meeting of the Board of Directors of the Berkshire Cotton Manufacturing Co., of Adams, Mass., was elected president, to succeed the late E. N. Gibbs.

—Thomas E. Bray, boss spinner at the Burlington Cotton Mills, Burlington, Vt., has resigned.

—W. F. Brown, formerly connected with the Dalton, Ga., Crown Mills, has been elected superintendent of the Canton, Ga., cotton mills, now in course of construction.

—H. A. Bell has given up the superintendency of the Camden Cotton Mills at Camden, S. C., to accept a like position with the Levi Cotton Mills, Rutherfordton, N. C.

—Thomas Clark, overseer of the cloth room in the Narragansett Mills, Fall River, Mass., has resigned to accept a similar position with the Flint Mills, Fall River.

—J. T. Chace has recently been appointed overseer of carding at the Wayne Cotton Mills, Goldsboro, N. C. Mr. Chace comes from Henderson, Ky.

—John T. Callin, overseer of spinning in the mills of the Wild Mfg. Co., Valatie, N. Y., has resigned, and removed to Elmira, N. Y., where he has a similar position.

—J. W. Cannada has succeeded W. H. Lanham as overseer of weaving at the Erwin Cotton Mills, West Durham, N. C.

—Mark B. Creed has secured the position of boss carder of Nos. 1, 2 and 3 Wamsutta Mills, New Bedford, Mass.

—Frank W. Dunn, formerly employed at the Canoe River Mills, Taunton, Mass., has taken a position as night carder in the Warren Cotton Mills of the Thorndyke Co., West Warren, Mass.

—D. L. Dawson, for some time boss finisher at the Dallas Cotton Mills, Huntsville, Ala., has resigned to accept a similar position in West Point, Ga.

—Richard Dunse, secondhand of towel weaving in the Boott Mill, Lowell, Mass., for the past two years, has been promoted to a larger fancy weaving room at the mill.

—John A. Drew, late of the Caraleigh Mills, Raleigh, N. C., has been appointed superintendent of the Neuse River Cotton Mills, in that city.

—Leland S. Ellis, assistant paymaster at the Pacific Mills, Lawrence, Mass., for the past 14 years, has resigned.

—O. H. Farr, recently with the Coosa Mfg. Co., Piedmont, Ala., has been appointed superintendent of the Walton Cotton Mill, Monroe, Ga.

—William Gilman, boss weaver at the China Mfg. Co., Suncook, N. H., has resigned and accepted a similar position with the Naumkeag Steam Cotton Co., Salem, Mass.

—W. Gravely, lately of New York Mills, N. Y., and previously with the Dominion Cotton Mills, Montreal, P. Q., is now boss spinner at the Queen City Cotton Co., Burlington, Vt.

—H. H. Groddick, late secondhand of weaving at the Laurens Cotton Mills, Laurens, S. C., has become boss weaver for the Darlington Mfg. Co., Darlington, S. C

—J. P. Henderson, overseer of carding at the Victor Mill, Greers, S. C., has resigned to take a similar position at the Louise Mill, Charlotte, N. C.

—Thomas Howarthe of the Windsor Cotton Mills, Windsor, N. S., has resigned and will take charge of the Waxahachie Cotton Mills, Waxahachie, Tex., now in process of construction.

—F. W. Hicks has been engaged as boss carder by the Tremont & Suffolk Mills, Lowell, Mass.

—W. R. Harris, for the past thirteen years overseer of carding at the Tuckaseege Mfg. Co., at Mt. Holly, N. C., has been appointed overseer of carding and spinning in the day time at the new Bonnie Cotton Mills, now under construction at Kings Mountain, N. C.

—C. A. Hodge, formerly night superintendent of the McColl Mfg. Co., McColl, S. C., now has charge of the carding department during the day, succeeding Charles Blackburn, who recently resigned and has moved to Charlotte, N. C.

—E. N. Jones, recently employed in the weaving department of the Sibley Mills, Augusta, Ga., will take charge of weaving at the new Strickland Cotton Mills, Valdosta, Ga.

—John Jackson has changed from overseer in the cloth room in the Shove Mills, to overseer of the same room in the Narragansett Mills, Fall River, Mass.

—Charles A. Johnson, overseer in the dyeing department of the Pemberton Mills in Lawrence, Mass., is about to leave, with his family, for Mexico, to accept a similar position.

—James Jordan, formerly of the Richard Borden Mills, Fall River, Mass., has commenced work as boss weaver for the Queen City Cotton Mill, Burlington, Vt.

—John F. Lord has resigned his position as overseer of weaving at Nantucket Mills, Spray, N. C., and accepted a similar position with the Southern Cotton Mills at Bessemer City, N. C.

—James Lee, overseer of weaving at the Shove Mills, Fall River, Mass., has resigned.

—William Larvey, formerly of the Stark Mills, Manchester, N. H., is now boss spinner at the Hooksett Mfg. Co., Hooksett, N. H.

—Thos. E. Mitchell has resigned the superintendency of the Vesta Mills at Charleston, S. C., and taken the general management and superintendency of the Millen Cotton Mills at Millen, Ga.

—J. McNabb, formerly at the Hamilton Mills, Amesbury, Mass., is now boss weaver at the Boott Cotton Mills, Lowell.

—J. A. Morris is now boss spinner at the Anderson Cotton Mills, Anderson, S. C., in place of J. W. Roberts, resigned.

—J. T. Moreland, who recently resigned the superintendency of the Henrietta Cotton Mill No. 1, Henrietta, N. C., has accepted the appointment of superintendent of the new Saxon Mills, Spartanburg, S. C.

—P. B. Murphy, until recently in the banking business, is general manager of the Newman Cotton Mills at Newman, Ga.

—Henry B. Metcalf, at a meeting of the directors of the American Hair Cloth Co., Pawtucket, R. I., was elected treasurer, to succeed the late Olney Arnold.

—L. E. McKethen, overseer of spinning with the Trion Mfg. Co., Trion Factory, Ga., has resigned to accept a similar position with the Mandeville Cotton Mills at Carrollton, Ga., under Supt. E. Montgomery.

—John Nuttall, boss weaver at the Sibley Mills, Augusta, Ga., has resigned.

—F. Ostern, overseer of weaving at the Piedmont, S. C., mills, has resigned after a continuous service of nearly 18 years. He has accepted the superintendency of the new Brandon Mill at Greenville, S. C., which, it is expected, will begin operations early in November.

—Frank P. Perkins will close his connection with the Lowell Bleachery, Lowell, Mass., Nov. 1st.

—J. A. Parker has been appointed overseer of carding at the Camden, S. C., mills, to take the place of H. W. Sullivan, resigned.

—Walter F. Potter, overseer of the spooling and shipping room of the Wamsutta Mills, New Bedford, Mass., has resigned, to take a position with the Granite Mills in Fall River. The employes under him presented Mr. Potter with a combination desk and bookcase, with all the necessary fittings.

—Harry Richardson, who has been overseer of the card room at No. 2 mill, West Warren, Mass., since it began to run nights, has resigned and gone to Ashton, R. I., to accept a similar place. He will be succeeded by William Robinson of Pawtucket, R. I.

—J. W. Roberts, recently overseer of spinning at the Anderson Mill, Anderson, S. C., is now with the Riverside Mill, in that city, having been made its superintendent.

—L. Brown Renfrew, at a recent meeting of the directors of the Renfrew Mfg. Co., Adams, Mass., was elected treasurer of the company, succeeding his father, the late James Renfrew.

—W. P. Rawlings, boss dyer at the Sibley Mills, Augusta, Ga., has resigned.

—J. M. Short is the new superintendent at the Sutro Cotton Mills at Yorkville, S. C. He was formerly of Charlotte, N. C., where he held the position of assistant superintendent at the Alpha Mills. He has appointed T. F. King overseer of spinning, and J. L. Grover overseer of carding.

—Benjamin L. Steward, superintendent of the Belmont Cotton Mill, Shelby, N. C., has retired.

—J. T. Smith has been appointed boss spinner at the Wauregan Mills, Wauregan, Conn.

—H. W. Sullivan, formerly overseer of carding at the Camden Cotton Mills, Camden, S. C., is now night superintendent at the McColl Mfg. Co., McColl, S. C., succeeding C. A. Hodge, who now has charge of the carding in the day time.

—W. K. Sanborn, superintendent of the Roger Williams Cotton Mills at Arcadia, R. I., has severed his connection with the concern to accept a similar position in a mill in Connecticut.

—George Tobey, formerly of the Lonsdale Bleachery at Lonsdale, R. I., has been appointed superintendent of the Lowell Bleachery at Lowell, Mass., succeeding Charles Meader, recently appointed agent.

—W. B. Williams has secured the position of boss weaver in the new mill of the American Spinning Co., Greenville, S. C. He was formerly with the Charleston Mills, Charleston, S. C.

—J. M. Ward, overseer of carding, has changed from the Pacolet, S. C., mills to the Gaffney, S. C., mills, where he succeeds E. D. Dubois, resigned.

Woolen.

—James C. Bothwell, of Amsterdam, N. Y., has been engaged as overseer of wool carding at night in the Tremont & Suffolk Mills, Lowell, Mass.

—F. Brown, formerly at Mechanicsville, Ct., has been engaged as boss dyer for the Cermania Mills, Holyoke, Mass.

—William Bateman, formerly for 12 years boss weaver for Hall & Co., manufacturers of dress goods, Jamestown, N. Y., and later with the Griffon Co., of Frankford, Philadelphia, Pa., has resigned his position with the latter company to engage in the manufacturing business in Frankford, Pa.

—Frank Byam, late of Rockwell's Mills, New York, has taken a position as dresser tender at the Dundee Woolen Mills, Passaic, N. J.

—Thomas W. Barker has resigned as boss dyer at the Robinson Mills, South Windham, Me.

—Charles Bromley has been engaged as boss carder by Graham, Clark & Co., Adams, Mass.

—M. J. Coughlin, North Billerica, Mass., has accepted a position as boss carder at Gardiner, Me.

—D. Connor, boss weaver at the Ludlow Woolen Mills, Ludlow, Vt., has resigned after a successful service of 20 years in that mill.

—Edmund Corcoran, who has been superintendent of the Hockanum Mills, Rockville, Conn., for seven years past, has resigned to accept the superintendency of the Providence Mills at Manton, R. I. He succeeds Frank W. Weeden, who is now in charge of the Fulton, N. Y., mills of the company.

—L. H. Corey has been promoted to boss spinner at the Ludlow Woolen Mill, Ludlow, Vt.

—Edward Devine has been appointed overseer of finishing at the Taconic Mills, Pittsfield, Mass.

—John Eastwood, late of Winooski, Vt., has recently accepted a position as overseer of finishing in the Amsterdam Woolen Mill, Amsterdam, N. Y.

—John F. Dustin, of Andover, has been engaged as boss fixer for the Bay State Worsted Co., Worcester, Mass.

—Otto Fiedler, designer for the Haile & Frost Mfg. Co., Hinsdale, N. H., has resigned.

—J. Fredericks has resigned as boss dyer at the River Spinning Co., Woonsocket, R. I., to go to South Africa.

—Peter Gough, formerly boss weaver in the mill of Simson & Kirkaldy, Woonsocket, R. I., has accepted a similar position with the Lakeside Worsted Mills, East Madison, Me.

—Arthur Genereux, formerly at the Jesse Eddy Mill, Fall River, is now boss finisher at the Puritan Mills, Plymouth, Mass.

—James Geoghegan has resigned as superintendent of the Jefferson Woolen Mill at Jefferson, Mass.

—James Gyngell, for some time boss weaver in the Puritan Woolen Mills, Plymouth, has gone to Schaghticoke, N. Y., to accept a position with the Schaghticoke Mills Co.

—Roger Graham, boss machinist at the Dunn Worsted Mill, Woonsocket, R. I., has resigned.

—William Jones, for eight years overseer of the carding department at the Yantic Woolen Mills, Yantic, Conn., has resigned, to accept a like position in the Devonshire Mills, Goffs Falls, N. H.

—G. W. Kendry, formerly employed at Hampden, Mass., has secured a position as boss weaver at the Cheshire Mills, Harrisville, N. H.

—E. Long, for some time employed in Gilsum, N. H., has accepted the position of boss carder at the West Swanzey Woolen Mill, West Swanzey, N. H.

—John E. Lang, formerly boss carder at Oakland, Md., is now with the Ludlow Woolen Mills, Ludlow, Vt., in a similar capacity.

—G. Lambert has succeeded George Thorpe as boss spinner for the Montville Woolen Co., Montville, Conn.

—William Miller, of Woonsocket, R. I., has resigned as master mechanic at the Lawrence Felting Mill, Millville, Mass.

—R. K. Marston is now boss dyer at the Burlington, Winooski & Colchester Mills, Winooski, Vt.

—John Mulrooney is now boss carder at the American Woolen Co.'s mill at Enfield, N. H.

—F. J. Mack, formerly overseer of the spinning department for the Hargraves Woolen Mill, North Shapleigh, Me., has resigned and gone to Woonsocket, R. I.

—Thomas J. Maxwell is now superintendent of the James J. Regan Mfg. Co.'s mill at Rockville, Conn.

—John Magner, boss dyer at the Faulkner Woolen Mills in Stafford Springs, Conn., has resigned and gone to Wilton, N. H., to take a similar position.

—Frank Nash, formerly boss carder at the Bridgeton Woolen Mill, Bridgeton, N. J., is now with the Oakland Mfg. Co., Baltimore, Md.

—J. W. Nary has resigned as superintendent of the Fulton Worsted Mills, Fulton, N. Y., which are now a part of the American Woolen Co., and Arthur Schwarz has resigned the superintendency of the cloth department. Frank Weeden of Providence will become manager, while Mr. Schwarz will be succeeded by his brother, Robert Schwarz.

—P. S. Plouff, boss weaver at the Amos Abbott Mfg. Co., Dexter, Me., has resigned.

—William E. Owens has resigned as boss carder of the Otrobando Woolen

Co.'s woolen mill of Norwichtown, Conn., and entered the employ of the Walhalla, S. C., Co., in a similar position.

—Henry Phillips has resigned his position in the weaving department of the Harrisville Woolen Mill, Harrisville, R. I., to take a similar position in Woonsocket, R. I.

—Joseph H. Priestly, overseer of weaving in the Bay State Mills of the American Woolen Co., Lowell, Mass., has resigned, and James Rule has taken his place.

—E. G. Tainter, formerly boss finisher for the Burlington Co., Burlington, Vt., has accepted a similar position with the Conshohocken Woolen Co., Conshohocken, Pa.

—C. H. Robinson, formerly of the Burlington Mills, Winooski, Vt., has accepted a position as boss wool sorter at Malone, N. Y.

—Charles Simmons, of Worcester, Mass., has succeeded Mr. Newell as boss dyer at the Puritan Mills, Plymouth, Mass.

—William Snyder, assistant superintendent of the Stevens Mills, North Andover, Mass., has resigned and removed to Schuylerville, N. Y.

—Fred Sawyer, of Harrisville, R. I., has been engaged by the Amos Abbott Co., Dexter, Me., to take the place of boss weaver made vacant by the resignation of Peter Plough, who has accepted the superintendency of the Penobscot Woolen Mill, Dexter.

—Thomas F. Smith, overseer of weaving at the Dunn Worsted Mills, Woonsocket, R. I., has resigned.

—Fred K. Stevens has resigned as boss spinner for the Springvale Woolen Co., Springvale, Me.

—W. A. Tucker has been engaged as designer by the Westerly Woolen Co., Westerly, R. I., of which W. O. & L. W. Arnold are proprietors. Mr. Tucker was formerly with the Sterling Worsted Mills, Clinton, Mass., and with the Blackinton Co. at Blackinton, Mass.

—J. C. Tilton, for some time with the Sugar River Mills, Newport, N. H., has accepted the position of boss weaver in a mill in Tilton, N. H.

—At the San Jose Woolen Mills, San Jose, Cal., the superintendent and general manager is A. McDonald; weaver and designer, William U. Hanke; carder, Wm. Lever; spinner, C. B. Floyd; dyer, Alfred Wildsmith; wet finisher, John Tallon, and dry finisher, E. S. Harrington.

—Robert Williams, boss weaver, has severed his connection with the Singleton Worsted Mill, Franklin, Mass., to accept a position with the Perseverance Worsted Co., Woonsocket, R. I.

—H. O. Wolf, who has been designer for the American Mills Co., of New Haven, Conn., has resigned his position to take up designing for wall papers, carpets and rugs for manufacturers.

—David F. Welsh, formerly of Lowell, Mass., and recently of Stafford Springs, Conn., has been engaged as finisher for the Kent Mfg. Co., Centreville, R. I.

—C. L. Whaley resigned his position as assistant superintendent of the mills at North Vassalboro, Me., securing a position in the River View Worsted Mills at Waterville, Me.

—Fred Young, secondhand of spinning at the woolen mill at Guild, N. H., owned by Fairbanks & Dorr, is now boss spinner on night force.

—C. P. Howe, secondhand weaver at Fairbanks & Dorr Woolen Mill, Guild, N. H., is now boss weaver at night.

—R. M. Armstrong, formerly with the Otrobando Woolen Co., of Norwichtown, Conn., is now with the woolen mill at Guild, N. H., owned by Fairbanks & Dorr.

Knit.

—A. W. Chapin, formerly of the Powhatan Mfg. Co., Norfolk, Va., will be superintendent of the Williamsburg (Va.) Mfg. Co.'s knitting mill.

—Ernest Cordin, superintendent of the hosiery department of the Vesta Knitting Mills at Providence, R. I., for the past ten years, has resigned to accept a position as manager and superintendent of a large knitting mill in Reading, Pa. Mr. Cordin was presented by his former employees a handsome roll-top desk and silver punch bowl.

—Roderick Light, late of Reading, Pa., has secured the position of fixer with the Echo Knitting Mills, Boston, Mass.

—Thomas J. Ford has succeeded Bernard Searle as night carder in the Saxony Knitting Mills at Little Falls, N. Y.

—H. A. Pratt, formerly overseer at the Glenark Knitting Mill, Woonsocket, R. I., has accepted a position with the Cling-Surface Co., of Buffalo, N. Y. He will be situated in New York City at 41 Cortlandt St.

—Claude Quinn, boss finisher in the Saxony Knitting Mills, Little Falls, N. Y., has been succeeded by William Brown.

—John Steinborg, formerly superintendent of the Lake Superior Knitting Co., Appleton, Wis., has been appointed general manager of the Fox River Valley Knitting Co., in Appleton, recently incorporated with $8000 capital to manufacture a general line of knit goods.

—C. H. Wilson, of Elmira, has been appointed superintendent of the Newport (N. Y.) Knitting Co.

—John T. Collins, formerly engaged with the Wild Mfg. Co., Valatie, is now overseer of cotton ring spinning at the Elmira (N. Y.) Knitting Mills.

—Patrick Fitts, of Cohoes, is now employed in the spinning department of the Anchor Knitting Mills, Whitesboro, N. Y.

—F. H. Moon, formerly at Albany, is now with the Wright's Health Underwear Co., Hoboken, N. J.

—James Shea, of Westerly, R. I., is now with the Superior Knitting Mills, Elmira, N. Y., filling the position of boss spinner.

Deaths.

—William E. C. Bradley, for many years a prominent figure in the woolen goods trade of New York, died October 21 at his summer home in New Canaan, Conn. He was 55 years old. After acquiring an education in Hartford, Conn., he went to New York and started as a boy in the business to which he devoted his life. He was at times with Carlton, Ayres & Co., and Frederick Vietor & Achelis, and then started in the domestic dry goods and cloaking business with A. Person, Harriman & Co., with whom he continued for many years. Subsequently he transferred his accounts to Megroze, Porter, Magny & Co., and in 1890, to Fleitmann & Co., with whom he was associated at the time of his death. Mr. Bradley represented a number of large woolen mills as manufacturer's agent, R. M. & Theodore Reynolds of Monson, Mass., Franklin Glazier & Son, Glastonbury, Conn., and Joseph H. Loudan, Wales, Mass., being among these.

—William Gibbs, for many years superintendent of the old Dexter Woolen Mills at Watertown, N. Y., died at Newburg, N. Y., recently.

—Howard M. Giles, of South Orange, N. J., a member of the firm of Watson, Porter, Giles & Co., importers and commission merchants in New York City, died suddenly of apoplexy, last month, in an elevated railroad train.

—George Burgess, a linen and dry goods merchant, died at Scarsdale, N. Y., last month, in his eighty-fourth year. In 1840 he came from England to this country and engaged in the importing business in New York City. For many years he was connected with John Gihon & Co., importers of Scotch and Irish linens, and later started in business on his own account. He retired several years ago.

—Gen. Olney Arnold, a prominent financier, manufacturer and citizen soldier, died Oct. 3d, in Pawtucket, R. I. He was born in Newton, Mass., Jan. 17, 1822. He was president of the First National Bank, treasurer of the Providence County Savings Bank and had the management of numerous trusts and the care of many estates, and was director and trustee of many corporations and institutions. From the beginning he was treasurer of the American Hair Cloth Co., and he organized the Pawtucket Electric Lighting Co. Mr. Arnold had been very much interested in the state militia, and held every office up to major general.

—E. N. Gibbs, treasurer of the New York Life Insurance Co., died at his home in New York City Oct. 20th. Mr. Gibbs was born in Massachusetts in 1841. At the time of his death he was also president of the Berkshire Cotton Mfg. Co., Adams, Mass., and a director in many institutions.

—Aaron Clark died in Buxton, Me., recently. He was 71 years old. For twenty years prior to 1866 he was interested in the production of woolen goods, either as manufacturer or agent.

—John L. Delahunty, at one time a prominent woolen manufacturer at West Fitchburg, Mass., died at his residence in Chicago, Ill., recently. He was a native of Oxford, Mass., and during his active life, up to about 1890, he had been engaged in the manufacture of woolen goods. During the last years of his life, he was in the brokerage business at St. Louis and Chicago. One son survives him.

—Patrick Murphy, a former president of the Joplin (Mo.) Woolen Co., died in Joplin, Mo., Oct. 12th, in his sixty-sixth year.

—Arthur B. Fox, junior member of the firm of Samuel Fox's Sons, proprietors of the La Porte, Ind., woolen mills, died October 14th of paralysis at that place, after a brief illness. He was 22 years of age, and had charge of the firm's Chicago office.

—Robert Develon, a well known carpet manufacturer of Philadelphia, Pa., died October 28th at his home, of pneumonia. Mr. Develon was thirty years old, and was associated with his brother, Thomas Develon, in the management of a large mill at Hancock St. and Lehigh Ave.

—Benjamin F. Perkins, senior member of the firm of B. F. Perkins & Son of Holyoke, Mass., died at the city hospital there Oct. 25th, after an illness of two days.

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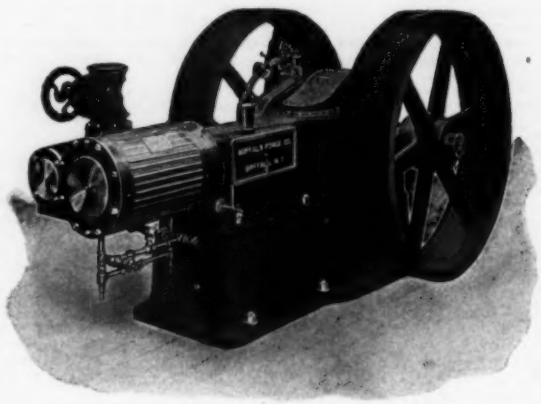

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NEW YORK. CHICAGO.

BUYERS' INDEX.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

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American Appraisal Co, Milwaukee, and 804 Park Row Bldg, New York.

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Architects and Mill Engineers.
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Ferguson, John W., Paterson, N. J.

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Asphalting & Asphalt Materials.
Warren Bros. Co , 143 Federal St., Boston.

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American Bridge Co., The, New York.

Burr Pickers.
Atlas Foundry & Mch. Co., Newark, N. J.
Curtis & Marble Machine Co., Worcester Mass.
Sargent's, C. G., Sons, Graniteville, Mass.

Calico Printers' Machinery and Supplies.
Arlington Machine Works, (Arthur Birch) Arlington Heights, Mass.
Birch Brothers, Somerville, Mass.
Butterworth, H. W., Sons & Co., Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Phillips Co, The Thomas, Providence, R I.
Taunton New Bedford Copper Co., New Bedford, Mass.
Rusden Machine Co., Warren, R. I.
See also Dyeing, Bleaching Machinery, etc.

Carbonizing.
Philadelphia Wool Scouring & Carbonizing Co., Philadelphia, Pa.

Card Clothing.
Ashworth, Elijah, Fall River, Mass.
Booth, Benj. & Co., Philadelphia.
Buck Card Clothing Co., Palmer, Mass.
Leigh, Evan A, 35 Mason Building, Boston.

Card Grinding Machinery.
Hardy Machine Co., Biddeford, Me.
Roy, B. S. & Son, Worcester, Mass.

Carders' Tools.
Brown, W. H, Mechanic St, Worcester Mass.

Carpet Machinery.
Altemus, W. W, & Son, 2816 N. 4th St, Phila. Pa.
Curtis & Marble Machine Co, Worcester, Ms.
Furbush, M. A, & Son, Machine Co, Phila, Pa.
Granger Foundry & Machine Co., Providence, R. I.
Howard, Geo. C., 1783 Barker St., Phila., Pa.

Cement "Dealers."
Warren Bros. Co., 143 Federal St., Boston.

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Foster, E. H. & Co., Cohoes, N. Y.

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Bullock & Crenshaw, 328 Arch St, Phila, Pa.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

Clutches.
American Tool & Machine Co., Boston, Mass.
Dodge Mfg. Co., Mishawaka, Ind.
Eastern Machinery Co., The, New Haven, Conn.
Hunter, James, Machine Co., North Adams, Mass.

Combs (Wool and Cotton).
Crabb, William, & Co, Newark, N. J.
Townsend, Thomas, 157 Orange St., Providence, R. I.

Commission Merchants (Dry Goods, Knit Goods).
Hirschman, H. 419 Broome St., New York.

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Ashworth, Elijah, Fall River, Mass.
Butterworth, H. W. & Sons Co., Philadelphia.
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Howard & Bullough American Machine Co, Pawtucket, R. I.
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Leigh, Evan A, 35 Mason Building, Boston.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
McKerrow, H. G & Co., Boston, Mass.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia, Pa.
Philadelphia Textile Machinery Co, Hancock and Somerset Sts, Philadelphia, Pa.
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Woonsocket Machine & Press Co, Woonsocket, R. I.
Worcester Warp Compressing Machine Co., Worcester, Mass.

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Howard & Bullough American Machine Co, Pawtucket, R. I.

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Kennedy, Thos. (Cutters, etc.,) Cohoes, N. Y.

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De Ronde, F. S, Co., 54 John St., New York.
Moore, Benj. & Co., Brooklyn, N. Y.

Dextrine.
Stein, Hirsh & Co, 165 Duane St., New York.

Dryers.
Antisdel, E. M., 12 Miller St., Utica, N. Y.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Brothers, Somerville, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Butterworth, H. W. & Sons Co., Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Kenyon, D. R. & Son., Raritan, N. J.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia.
Philadelphia Textile Machinery Co, Philadelphia, Pa.
Phillips Co, The Thomas, Providence, R. I
Rusden Machine Co., Warren, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Dusters.
See Wool and Waste Dusters.

Dyers, Bleachers and Finishers.
American Yarn Printing Works, 134-140 North 22d St., Philadelphia.
Brophy's, T, Sons, Jasper St, Philadelphia
Capstick, John & Sons, Montville, N. J.
Cohoes Dye Works, Cohoes, N. Y.
Cranston Worsted Mills (yarns), Bristol, R. I.
Duncan & Baillie, Cohoes, N. Y.
Firth & Foster Co, Kensington, Pa.
Greenwood, R. & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket and Valley Falls, R. I.
Littlewood, G. J., & Sons, Manayunk, Pa.
Lorimers, The Wm. H. & Sons Co., Phila.
Molt Bros., Millbury, Mass. (Indigo Blue.)
Pawtucket Dyeing & Bleaching Co, Pawtucket, R. I.
Philadelphia Linen Finishing Co., Frankfort, Philadelphia.
Rowland, Samuel, Schuylkill Haven, Pa.
Warren, W, Thread Works, Westfield, Mass.

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Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Bros., Somerville, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Butterworth, H. W, & Sons Co Phila Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Delahunty Dyeing Machine Co., Pittston, Pa.
Fairmount Machine Co, 22 and Wood Sts. Philadelphia.
Frank's Wagon Works, 2731 N. 6th St., Philadelphia.
Granger Foundry & Machine Co, Providence, R. I.
Hopkins, Machine Works, Bridgeton, R. I.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Kenyon, D. R. & Son, Raritan, N. J.
Knapp, C. H., Paterson, N. J.
Lincoln, The, Co, 54 Arch St, Hartford, Ct.
Lintner, Wm. T., Gloversville, N. Y.
Parks & Woolson Machine Co., Springfield, Vt.
Peel, Samuel H. Germantown, Philadelphia Pa.
Phenix Iron Foundry, Providence, R. I.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia, Pa.
Philadelphia Textile Machinery Co, Hancock and Somerset Sts, Philadelphia, Pa.
Phillips, The Thomas Co, 91-95 South Main St, Providence, R. I.
Rusden Machine Co., Warren, R. I.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass. (Drying.)
Webendorfer & Walling, Paterson, N. J.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Dye House Cans.
Hill, James Mfg. Co., Providence, R. I.

Dyehouse Floors.
Warren Bros., 143 Federal St., Boston.

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Bailey, Frank, Cedar Brook, New Jersey.
Haedrich, E. M , Philadelphia, Pa.

Dyestuffs and Chemicals.
American Aniline Co., 163 No. Front St., Philadelphia.
Anchor Color Mfg. Co, 464 Cherry St, New York.
Atteaux, F. E. & Co., 174-176 Purchase St., Boston.
Berlin Aniline Works, 72 Front St., N. Y.
Bischoff, & Co, 87 Park Place, N. Y.
Bosson & Lane, 36 Central Wharf, Boston.
Corey, S. J, 273 Congress St, Boston.
Dillon & Co. 20 Cedar St, New York.
Farbenfabriken of Elberfeld Co, 40 Stone St, N. Y.
Geisenheimer & Co, 189 Front St, New York.
Innis & Co, 3 Cedar St, New York.
Janney, O. S, & Co, Phila. and Boston.
Johnson, Chas. A, & Co, 22 Dey St, N. Y
Johnson, Wm. G, & Co, Uncasville, Conn.
Jones, J. Howell, 18 Burling Slip, New York.
Keller, John J, & Co, 104-106 Murray St, N. Y.
Klipstein, A, & Co, 122 Pearl St, N. Y.
Koechl, Victor, & Co. 122 Hudson St, N. Y.
Kuttroff, Pickhardt & Co., New York.

Matheson, W. J. & Co, 182-184 Front St, N.Y.
Merrimac Chemical Co, Boston, Mass.
Molt Bros., Millbury, Mass. (Indigo Blue.)
N. Y. & Boston Dyewood Co, 55 Beekman St, New York.
Oakes Mfg. Co, 93 Pearl St, N. Y.
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Thayer, Ed. M., 106 Broad St., Boston, Mass.

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Sturtevant, Co., B. F. Boston.

Edgings.
See Tapes, Braids and Edgings.

Elastic Web Calendering Machines.
Knapp, C. H., Paterson, N. J.

Electrotyping and Printing.
Whitcomb, H. C, & Co, Boston.

Elevators.
Cohoes Foundry & Machine Co, Cohoes, N.Y.
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Philadelphia Electric Construction Co., Philadelphia.

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Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co., B. F., Boston.

Electric Motors.
Sturtevant Co., B. F., Boston.

Engine Foundations.
Warren Bros. Co., 143 Federal St., Boston.

Engineers, Mechanical.
American Bridge Co., The, New York.
Ferguson, John W, Paterson, N. J.
Rittenhouse, Frank, Norristown, Pa.

Exhaust Heads.
Burt Manufacturing Co , Akron, Ohio.

Fans—Exhaust and Ventilating.
See Ventilating Apparatus.

Feed Water Heaters.
Pendleton, Walter & Co., New York.

Feed Water Pumps.
Goulds Mfg. Co, Seneca Falls, N. Y.
Phœnix Iron Foundry, Providence, R. I.

Finishing Machinery.
See Dyeing, Drying, Bleaching and Finishing.

Fireproof Construction.
American Bridge Co., The, New York.

Fluted Rolls.
Cohoes Foundry & Machine Co, Cohoes, N.Y
Thurston, A. G, & Son, Box 528, Fall River. Mass.

Forges.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co., B. F., Boston.

Friction Clutches.
See Clutches.

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Eastern Machinery Co., New Haven, Conn.

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Hunt, Rodney, Machine Co, Orange, Mass.
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Gas Engines.
Jones, Lewis, 60½ and Media Sts, Phila, Pa.

Gas Exhausters.
Sturtevant Co., B F., Boston.

Gear Cutting Machine.
Whiton, The D. E, Co, New London, Conn.

Generating Sets.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co., B. F , Boston.

Heating.
See Ventilating.

Heddles.
Watson, L. S, Mfg. Co, Leicester, Mass.

Hoisting Machinery.
The Eastern Machinery Co., New Haven, Conn.

Hose.
Boston Belting Co., Boston.

Hosiery Boards.
Pearson, J. T, Kensington, Pa.

Humidifying Apparatus.
American Air Moistening Co., Boston.

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American Tool & Machine Co , Boston.
Rusden Machine Co,. Warren, R. I.
Webendorfer & Walling, Paterson, N. J.

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Friedberger & Co, Edgings, Germantown Phila, Pa.
Fleming & Chapin, Philadelphia
Hepner & Rorwitz, Lacings, 30 Howard St, N. Y.
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Willcox & Gibbs Sewing Mch. Co., New York.

Knitting Machine Cylinders.
Paxton & O'Neill, 129 Bread St, Phila, Pa.
Rittenhouse, Frank, Norristown, Pa.
Stafford & Holt, Little Falls, N. Y.

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American Knitting Machine Co., Woonsocket, R. I.
Beattie, Wm. & Son, Cohoes, N. Y.
Branson Machine Co., 506 John St., Philadelphia.
Campbell & Clute, Cohoes, N. Y.
Cooper, Chas, Bennington, Vt.
Crane Mfg. Co, Lakeport, N. H.
Excelsior Knitting Machine Manufacturing Co., Allentown, Pa.
Fisher Ktg Mch. Co., Utica, N. Y.
Hepworth & Co, Lehigh Ave. and Mascher St, Phila, Pa.
Jenckes, E. Mfg. Co, Pawtucket, R. I.
Jones, Lewis, 60 1-2 and Media Sts, Philadelphia, Pa.
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Leighton Machine Co, Manchester, N. H.
Lindley, Geo. W., 5122 Wakefield St., Germantown, Pa.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
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Mueller, Arthur, 760 Lexington Avenue., Brooklyn, N. Y.
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Pepper Mfg. Co, Lakeport, N. H.
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Stafford & Holt, Little Falls, N. Y.
Taylor, James, 835 Arch St., Philadelphia.

Knitting Needles and Supplies.
Breedon, Wm, & Son, Amsterdam, N. Y.
Cooper, Chas, Bennington, Vt.
Corey, Wm, Co, Manchester, N. H.
Crane Mfg. Co , Lakeport, N. H.
Dodge Needle Co., Manchester, N. H.
Ives, Loyal T. New Brunswick, N. J.
Kavanaugh, Geo. W., Cohoes, N. Y.
Lydall, H, & Foulds, Manchester, Conn.
Manufacturers' Supplies Co., 66 No. 4th St. Philadelphia.
Mayo Knitting Machine & Needle Co, Franklin, N. H.

Page Needle Co , Chicopee Falls, Mass.
Treat, Orion, Manchester Green, Conn.
Wardwell Needle Co, Lakeport, N. H.

Laboratory Outfits.
Bullock & Crenshaw, 526 Arch St. Phila, Pa

Looms.
Crompton & Knowles Loom Works, Worcester, Mass.
Draper Company, Hopedale, Mass.
Fairmount Machine Works, 22d and Wood Sts. Philadelphia.
Furbush, M. A., & Son Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St , Phila., Pa. (For wire.)
Kilburn, Lincoln & Co, Fall River, Mass.
Leigh, Evan A., 35 Mason Bldg., Boston.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Whitin Machine Works, Whitinsville, Ms,
Woonsocket Machine & Press Co, Woonsocket, R. I.

Lubricators.
Ameledema Oilless Bearing Co., Berkeley St , Wayne Junction, Philadelphia.
Dixon, Jos., Crucible Co, Jersey City, N. J.

Lumber.
Stearns, A. T, Lumber Co, Neponset, Mass.

Lumpers.
Gerry, George, & Son, Athol, Mass.

Machinery Dealers.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Schofield, Geo. L. Phila., Pa.
Taylor, James, 835 Arch St., Philadelphia.

Machinists' Tools.
Dodge Mfg. Co., Mishawaka, Ind.
Whiton, The D. E. Co, New London, Conn.

Mails.
Walder, J, Paterson, N. J.

Mechanical Draft.
Boston Blower Co., Hyde Park, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co., B. F., Boston.

Measuring and Folding Machines.
Curtis & Marble Machine Co, Worcester, Ms.
Elliott & Hall, 54½ Hermon St, Worcester Mass.
Fabric Measuring & Packaging Co., Postal Telegraph Bldg , New York.

Mercerizing Machinery.
Butterworth, H. W. & Sons, Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Rusden Machine Co., Warren, R. I.

Mill Brushes.
See Brushes.

Mills For Sale.
Denny, R. B., 143 Federal St., Boston.

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American Bridge Co., The, New York.
Ferguson, John W, Paterson, N. J.

Mill Supplies.
American Supply Co, Providence, R. I.
Bamford & Smith, Pascoag, R. I.
Bristol, The, Co., Waterbury, Conn
Buckley's, Benj. Son, Gun Mill, Paterson, N. J.
Dixon Lubricating Saddle Co , Bristol, R.I.
Dodge Mfg. Co., Mishawaka, Ind.
Easton-Burnham Co., Pawtucket, R. I.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Jeffrey Manufacturing Co., Columbus, O.
Sweet & Doyle, Cohoes, N. Y.
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Watson, L. S, Mfg.Co, Leicester, Mass.

Napping Machines.
American Napping Machine Co, Williamstown, Mass.
Ardrey, S. B, & Sons, Bristol, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Jones, Lewis, 60 1-2 and Media Sts., Philadelphia, Pa.

Neck Shaping Machine.
Eclipse Machine Co., Sanquoit, N. Y.

Noils (Silk.)
Ryle, Wm. & Co., 54 Howard St., N. Y.
Malcolm Mills Co., Frankford, Pa.

Numbering Machine.
Bates Machine Co., 346 Broadway, New York.

Oil Filters.
Burt Manufacturing Co., Akron, Ohio.

Packing.
Boston Belting Co , Boston.
Jenkins Bros., New York.

Paint.
DeRonde, F. S. Co, 54 John St., New York City.
Moore, Benj. & Co, Brooklyn, N. Y.

Painting and Whitewashing Machine
Triumph Machine & Manufacturing Co. 209 Hester St , New York, N. Y.

Pantagraphs for Mill Engraving.
Johnson, C. A, & Co, 22 Dey St, New York.

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Crosby & Gregory, 34 School St, Boston, Mass.
Siggers, E. G., Washington D. C.

Pavers & Paving Materials.
Warren Bros. Co., 143 Federal St., Boston.

Perforated Metal.
American Perforated Metal Co., 171 Wooster St., New York.
Beckley, A. J. & Co., Garwood, N. J.
Harrington & King Perforating Co., 230 North Union St , Chicago, Ill.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co., 100 William St, New York.

Picker Sticks.
Loom Picker Co., Biddeford, Me.

Picking, Carbonizing and Garnetting.
Garfield Woolen Co, Garfield, N. J.

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Keasby, R. A. 83 Warren St, New York.

Pneumatic Conveying.
See Ventilating.

Power Transmitting Machinery.
Ameledema Oilless Bearing Co, 149 West Berkley St, Wayne Junction, Pa.
Christiana Machine Co., Christiana, Pa.
Dodge Mfg. Co., Mishawaka, Ind.
Eastern Machinery Co, New Haven, Conn.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jeffrey Manufacturing Co., Columbus, O.
Kilburn, Lincoln & Co, Fall River, Mass.
Link Belt Machinery Co, Chicago, Ill.
Rusden Machine Co., Warren, R. I.
Saginaw Manufacturing Co., Saginaw, Mich.

Presses.
Boomer & Boschet Press Co., 338 West Water St., Syracuse, N. Y.
Butterworth, H. W. & Sons Co., Philadelphia
Crawford, J. J, & Son, Nashua, N. H. (Power Screw, Hydraulic, Hollow Steam Plate.)
Curtis & Marble Machine Co, Worcester, Ms.
Fisher Ktg. Machine Co., Utica, N. Y. (For Knit Goods.)
Hart, Charles, Frankford, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Phillips Co, The Thomas, Providence, R. I.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Printers (Fabrics and Yarn.)
Capstick, John & Sons, Montville, N. J
American Yarn Printing Works, Philadelphia.

Pulleys.
See Power Transmitting Machinery.

Pulley Covers.
Warren Mfg, Co., Chicago, Ill.

Pumps.
Goulds Mfg. Co, Seneca Falls, N. Y.
Rusden Machine Co., Warren, R. I.

Quills.
Parker, Henry Co, Springfield, Vt.

Reed and Harness Manufacturers.
American Supply Co, Providence, R. I.
Walder, J, Paterson, N. J.

Ribbons.
Cheney Bros, S. Manchester, Ct.

Ring Travellers.
National Ring Traveller Co., Providence, R. I.
Morley Button Mfg. Co., Boston.

Roofing Asphalt.
Warren Bros. Co., 143 Federal St., Boston.

Roofing, Gravel, Slag and Composition.
Eastern Granite Roofing Co., Jersey City N. J.

Roofing Materials (Manufacturers).
Warren Bros. Co., 148 Federal St., Boston.
Rope Transmission.
American Mfg. Co., New York.
Dodge Mfg. Co , Mishawaka, Ind.
Rove Traverse.
Rawlins, J. H, Chester, Pa.
Roving Cans.
Hill, James Mfg. Co., Providence, R. I.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.
Laminar Fibre Co., No. Cambridge, Mass.
Walrus Fibre Mfg. Co., Medford. Mass.
Rubber Covered Rollers and Goods.
Boston Belting Co., Boston.
Saddles and Stirrups.
Dixon Lubricating Saddle Co., Bristol, R. I.
Scales
Sweet & Doyle, Cohoes, N. Y.
Schools.
American Correspondence School of Textile, New Bedford, Mass.
Lowell Textile School, Lowell, Mass.
New Bedford Textile School.
Philadelphia Textile School, Phila, Pa.
Screens (Perforated.)
See under Perforated Metal.
Separators.
Ring Frame Thread Separator Co., The, Amsterdam, N. Y.
Draper Co , The, Hopedale, Mass.
Sewing Machines and Supplies.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Bros., Somerville, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Excelsior Sewing Machine Co., Philadelphia.
Industrial Mfg. Co., Camden, N. J.
Manufacturers' Supplies Co., 66 No. 4th St., Philadelphia.
Nye & Tredick, 606 Arch St, Phila, Pa.
Rusden Machine Co., Warren, R. I.
Scott & Williams, 6th and Arch Sts, Phila, Pa.
Union Button Sewing Mch. Co., 164 High St., Boston.
Wilcox & Gibbs S. M. Co., New York.
Shafting Hangers, Etc.
See Power Transmission Machinery.
Shearing Machinery.
See Dyeing, Drying, Bleaching and Finishing.
Shell Rolls.
Cohoes Foundry & Mach. Co, Cohoes, N. Y.
Thurston, A. G, & Son, Box 528, Fall River, Mass.
Shoddies.
See Wool Shoddies.
Shuttles.
See Bobbins, Spools, Shuttles, Etc.
Silk Machinery.
Butterworth, H. W. Sons Co, Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Knapp, C. H., Paterson, N. J.
Mason Machine Works, Taunton, Mass.
Rusden Machine Co., Warren, R. I.
Webendorfer & Walling, Paterson, N. J.
Singe Plates.
Butterworth, H. W. Sons Co., Philadelphia.
Taunton-New Bedford Copper Co., New Bedford, Mass.
Singeing Machines.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Brothers, Somerville, Mass.
Butterworth, H. W. Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Ms.
Granger Foundry & Machine Co., Providence, R. I.
Knapp, C. H , Paterson, N. J.
Rusden Machine Co., Warren, R. I.
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Whitin Machine Wks, Whitinsville, Mass.
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N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.
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Woonsocket Machine and Press Co., Woonsocket, R. I.
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International Sprinkler Co., Philadelphia, Pa.
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Wells, Wilfred, 505 W. Lehigh Ave., Philadelphia.
Steam Boilers.
Babcock & Wilcox Co., The, 29 Cortland St., New York City.
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Pendleton. Walter & Co., New York.
Steam Boiler Compound.
Straus & Co., 55 Broad St., New York.
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Hartford Steam Boiler Inspection & Insurance Co, Hartford, Conn.
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Jenkins Bros., New York.
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Cypress Lumber Co, Apalachicola, Fla.
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Rusden Machine Co., Warren, R. I.
Stearns, A. T, Lumber Co, Neponset, Mass.
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Philadelphia Electric Construction Co., Philadelphia.
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Ring Frame Thread Protector Co., The, Amsterdam, N. Y.
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Frank's Wagon Works, 2731 N. 6th St., Philadelphia.
Towers.
Caldwell Co., W. E. 202 Brook St., Louisville, Ky.

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Excelsior Sewing Machine Co., Philadelphia.

Turbines.
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Hunter, Jas, Machine Co, No. Adams, Mass.
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Leffel, James & Co, Springfield, Ohio.

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Taylor, Jas., 835 Arch St., Philadelphia.

Winder Bobbins.
Sweet & Doyle, Cohoes, N. Y.

Winders. (Hosiery.)
Universal Winding Co, 95 South Street, Boston.

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Dodge Mig Co., Mishawaka, Ind.
Saginaw Manufacturing Co, Saginaw, Mich.

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Woonsocket Machine & Press Co Woonsocket, R. I.
Worcester Warp Compressing Machine Co., Worcester, Mass.

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Garfield Woolen Co, Garfield, N. J.
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Dexter Yarn Co., Pawtucket, R. I.
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1683 **Woolen Supt.** Large experience. Last mill where he was employed was for five years overseer and 15 as superintendent. A good man on flannels, sackings, skirtings, woolen dress goods and domestic woolen goods. Well up in weaving, dyeing, carding, etc., and has a general knowledge of all departments in a Western woolen mill. Englishman; married. Refers to past employers.

1796 **Supt. of Worsted Mill.** Age 35; English; married. Would take position as overseer of spinning. Has had six years' experience in a mill as overseer of spinning, drawing, combing, scouring and sorting, also twisting, doubling, skein winding and dresser spooling.

1793 **Supt. of Woolen Mill.** Age 46; American; married. Cassimeres, dress goods, flannels, doeskins, blankets, etc., in fact most all classes of goods. Crompton & Knowles looms and Davis & Furber cards and mules. Refers to past employers.

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1768 **Supt. and Designer** in a worsted or woolen mill. Prefers worsted mill. Now employed as designer and assistant supt., but is competent to take charge of a mill. Is familiar with all makes of machinery, and has manufactured nearly all classes of goods. Will not change for less than $2,000 a year. Excellent references.

COTTON SUPERINTENDENTS.

1686 **Cotton Supt.** Age 53; American; married. Large experience. Been in present position as superintendent for a number of years and previously in the same mill as overseer of weaving. Nearly all kinds of goods. Is familiar with nearly all makes of machinery. Refers to past employers.

1689 **Supt. or Assistant Supt.** Age 37; American; married. Large experience as overseer and first-class references. At present employed as overseer, but is capable of filling a superintendent's position. Worked on prints, twills, sheetings, cambric and fancies.

1673 **Cotton Supt., Carder, and Spinner.** Age 23; English; single. Large experience in English mills. Can take position at once. Has worked on all kinds of cotton machinery.

1754 **Wanted,** position as superintendent in cotton mill. Thoroughly understands coarse and fine yarns, combed and carded, and all classes of white goods.

189 **Cotton Superintendent** wants position in Northern mill. Has been in charge of Southern mills for 7 years. Previous experience in N. E. Is well known among mill men, and can furnish the best of references. Age 35; married.

1772 **Supt. or Overseer of Weaving.** Age 38; American; married. Lawns, fine sheetings and shirtings, sateens, twills, fancies, denims and cottonades. Is familiar with Whitin, Lowell, Draper, Northrop and English machinery. Not at present employed.

1306 Young American wants position as cotton superintendent. Experience mostly on cotton warps. Has been bookkeeper, overseer of carding and spinning; also superintendent in Massachusetts mills.

1532 **Superintendent.** Has been in mill business all his life, and been with the present firm for a number of years, having been promoted several times. He wishes to better himself.

WOOLEN CARDERS.

1696 **Carder,** or secondhand. Experienced on cassimeres, cloakings, blankets, shawls, jeans, and is familiar with Furbush, Bridesburg and Smith cards. Wants position in Western or Southern States. Can take place immediately. Age 30; American; single.

1798 **Boss Carder,** or carder and spinner. Age 49; English. Large experience on fine, medium and coarse wool, also wool, cotton and shoddy mixes, cassimeres, flannel , blankets, kerseys meltons, beavers, government goods, etc. Excellent references and first class man in every respect. Was nine years boss carder in England and has held good positions in this country as boss carder and spinner.

1707 **Overseer of Carding.** Worked for 21 years in a woolen mill as boss carder, but through sickness was obliged to resign his position. Is now ready and wants a situation at once. Age 49; American; married. Wants $3 a day. Has worked on dress goods and flannels.

1801 **Overseer of Carding.** Age 27; German; married. Dress goods, knit goods, wool and cotton mixes, blankets and paper makers' felts. Is familiar with all kinds of American machinery. Wants $3.00 per day.

1799 **Boss Carder.** Age 32; American; married. Has worked on beavers, kerseys, chinchillas, cloakings and suitings. Is familiar with Davis & Furber, Cleveland and Furbush machinery. Wants not less than $2 50 per day. Excellent references.

1270 **Boss Carder** (and spinner, if desired) in an underwear or hosiery mill. Fine and heavy wool and cotton. German; age 34. First class man in every respect. Excellent references.

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1736 **Overseer Cotton Card Room** and Combing. Age 39; married. Has been overseer for past nine years. In last position seven years. Started up two large rooms with combers in each. Thoroughly understands all machinery in card room, and has run all grades of cotton. Can furnish references, if required.

1759 **Boss Cotton Carder.** 25 years old. Has had 12 years' experience in a cotton carding room, and is well advanced in drafting and changing. Speaks French, Italian and English. Willing to go South or West. Refers to past employers.

1718 **Second-Hand in Cotton Card** Room. Has had 10 years' experience in N. E. mill. Understands all makes of machines. Can make all changes from 1 to 20 hank. Has taken course in cotton spinning at American Correspondence School of Textiles, New Bedford. First-class references. Would start at $2 00 a day. Young man and strictly temperate.

1720 **First Class Cotton Carder or** Supt. Has had the advantage of a great deal of experience in the various departments, and is thoroughly posted on all details of manufacturing and machinery. Would accept a position North or South. 36 years of age; American; married. Worked on print cloths, twills and sheetings. Has had charge of bleaching.

1782 **Overseer Cotton Carding.** Age 25; single. Fine carded and combed cotton yarns. Is familiar with all makes of machinery. Wants $3.50 per day.

WOOLEN SPINNERS.

1709 **Worsted Spinner or Section** Hand. Age 22 and unmarried. At present employed, but not satisfied with surroundings. Would accept moderate pay.

1784 **Worsted Drawer and Spinner.** Would take twisting. Age 2-; English; single. Can furnish references as to ability and character.

633 **Woolen Mule Spinner** desires to move from Maine on account of wife's health. At present in good position. Age 37; married, Scotchman.

1691 **Boss Spinner** Large experience in first-class N. E. mills on flannels and all kinds of fancy cassimeres. Englishman; age 50; married. Refers to past employers.

1543 **Woolen Spinner and Carder.** Has handled both departments together and separately. Will go South or West. Age 29; single.

1601 **Woolen Spinner,** or painter and glazer in any kind of mill. Age 31; Irish; married. Wants $10 50 per week. Has worked on cheviots, overcoatings, broadcloths, satinets, hosiery, yarns, etc.

1519 **Overseer of Woolen Spinning.** Age 31; married. Has worked on yarns from 1 run down to 5/4. Some experience on shoddy. Will work for moderate salary.

COTTON SPINNERS.

1636 **Overseer Cotton Spinning, Spooling, Warping, Etc.** Has held position seven years of second-hand and has taken textile school courses. Having had unusual opportunities to learn, he feels competent to take position as overseer. Highly recommended by present employers.

1788 **Overseer of Ring Spinning,** spooling and warping. Age 27; American; married. Has worked on yarn Nos. 15 to 70. Is familiar with Saco frames, Lowell, Whitin, Fales & Jenks, and Mason.

1364 **Mules or Frames.** 34 years old; married. Thoroughly understands all makes of English and Mason mules. Has set up machinery and been expert fixer. Wants good position as overseer of mule room, or would take charge of frames. Accept $3.50 per day. Best references.

1663 **Overseer Mule Room.** Eleven years' experience in Fall River mills, and for the past ten years overseer of mule room. Excellent reference from present employer. Age 44, married.

1698 **Overseer of Mules.** 34 years old; married; English. 10 years' experience, chiefly on English mules, on all grades of cotton yarn. Would like to get a large job.

1703 **Overseer Ring Spinning, Warping and Spooling.** Is experienced on white work from Nos. 4's to 30's. Is familiar with Whitin and Lowell Machine Shop spinning frames and spoolers and warpers. Wants $3 per day to start with. Age 39; American; married.

1690 **Cotton Mule Spinner.** Age 42; French; married. Has worked on prints and sheetings and on yarns from 9's to 50's. First class references. Two years' experience as secondhand and five as overseer. Wants $2.50 per day to start with.

WOOLEN WEAVERS.

1645 **Overseer Weaving.** Age 30; married, American. Has worked in weave room since he was 17 years old, as weaver, fixer and secondhand of weaving, except for a short time was traveling salesman. Has worked on ladies' dress goods, men's fine worsted suitings, overcoatings, cloakings, etc., on Crompton & Knowles and Jacquard looms. Excellent references.

1712 **Second-Hand or Overseer of** Weaving. Age 29; American; single. Has some knowledge of designing. Has worked on fancy worsteds cassimeres and cheviots. Wants $2.50 per day to start with. Is familiar with Crompton & Knowles machines.

1688 **Overseer of Weaving** in large mill, designer in small mill, or assistant designer in a large mill. Age 38; German; single. Has worked on beavers, chinchillas, fine cassimeres, fine fancy worsteds, ladies' dress goods, army goods, union cassimeres and other classes of goods. Strictly temperate and industrious.

1536 **Boss Weaver or Superintendent.** Age 43; married; American. Can run any department in woolen mill, having been in business for himself. Not at present employed. Can take position immediately.

1468 **First-Class Weaver** on fancy woolens, worsteds and meltons, cotton worsteds and shoddy goods. Can take overseer position after 6 days' notice. Has been loom fixer, boss and superintendent. Age 43. Crompton & Knowles looms.

1790 **Boss Weaver**, or would accept good loom fixing job. Age 30; French; married. Has worked on satinets, unions, cassimeres and men's wear. Knowles, Gilbert Stafford and Crompton looms.

COTTON WEAVERS.

1681 **Overseer or Secondhand of Cotton Weaving.** Has had long experience as loom fixer, secondhand and overseer, and can furnish excellent references. Has also had charge of cloth hall and drawing departments. With one mill was 15 years.

1783 **Secondhand or Overseer** of cotton weaving, or assistant designer. Age 25; American; single. Just completing two year course in both designing and weaving. Is a practical loom fixer of three years' experience.

1708 **Overseer of Weaving.** Has had 15 years' experience on 12 different kinds of looms and most all kinds of cotton goods. Has worked in some of the largest mills in the South.

1738 **Overseer of Weaving, Drawing in,** Warping, Slashing and all preparations. 14 years' experience in colored mill in Manchester, Eng., and two years in this country. Age 37; English; married. Has worked on sateens, drills, dress goods, zephyrs, turkish towels, and can pick out own pattern for weaving and drawing-in. Understands the different makes of looms. Wants $3.00 per day.

1459 **Fancy Cotton Weaving,** Slashing, etc. Age 36; married. Has worked on all kinds of fancy goods and is thoroughly competent in all departments of manufacturing, with the exception of spinning. Understands velvet and corduroy weaving. Is not at present employed and can take a position immediately.

1668 **Overseer of Weaving.** Age 41; English; married. Has had large experience as loom fixer and secondhand of weaving, and is competent to take an overseer's job. Has worked on shirtings, sheetings, sateens, fancy lenos, and all grades of fine goods all the way from 2 to 25 harness.

KNITTERS.

1755 **Boss Knitter or Fixer.** Has worked on eiderdowns, astrachans, cardigan jackets, balbriggans, rubber linings and fancy knit goods. Will not change for less than $5 a day.

1797 **Supt. Hosiery Mill.** Age 30; married. Children's, ladies' and men's cotton hosiery. Now employed in South, but does not like locality. Would prefer a position in Pennsylvania.

1722 **Supt. of Knitting.** Age 37; American; married. Long experience as overseer fits him for superintendent's position. Has also worked three years in machine shop, setting up knitting machines and making the different parts of same. Has worked on cotton, wool, merino and silk; plain and ribbed hosiery and underwear. First-class recommendations.

1780 **Boss Knitter** on flat or fleece-lined underwear and fancy overshirts. Age 33; Canadian. Is familiar with all makes of circular spring needle machines, also all rib machines in spring or latch needle, also understands sewing machines, loopers, etc. All references.

1777 **Overseer of Knitting.** Has worked on ladies' and infants' underwear. Standard makes of machines. Wants $21 per week. Age 33; English. Refers to past employers.

1776 **Boss Knitter.** Had constant experience in the knitting business for the past twenty years. Can handle any kind of goods made on a circular spring needle knitting machine. Age 36; American; married. Excellent references.

DYERS.

1733 **Dyer.** Age 33; married; a Scotchman. Worked in Scotland, and has been over seven years in this country as secondhand for a large manufacturing concern, with whom he is at present, but desires to change to a position where he will have full charge. Has handled cotton yarn from 10's to 80's in warp and skein, also experienced on worsted and silk yarns. Can furnish references as to character and ability.

1676 **Dyer,** or would take secondhand position in a large mill. Age 35; English; married. 11 years' experience in a first-class N. E. mill as secondhand and overseer. Wools and piece dyed goods.

1664 **Boss Dyer.** Age 40; Scotch, married. 14 years' experience as boss dyer. 20 years in all at trade. Has worked on wool, cotton, ramie, worsted, shoddy and union waste dyeing for overcoatings, linings, tweeds, cassimeres, plaids, flannels, and ladies' wear, also on all wool and union piece dyes, hosiery, knit goods, yarns, slubbing. Is practically familiar with scouring, bleaching, carbonizing, speck dyeing and mill soap making.

1778 **Dyer of Wool, Felt,** etc. Age 25; American; married. Refers to past employers.

1781 **Boss Dyer and Finisher.** Age 20; Scotch; single. All wool and cotton mixed blankets, fine and coarse flannel. Some cassimeres and shoddy goods. Refers to past employers.

1714 **Cotton Yarn Dyer.** Age 36; Scotch; married. Has had 15 years' experience on fast shades. Wants $4 00 to start.

FINISHERS.

1526 **Foreman of Finishing Room,** Folding Packing, etc. Age 45; married; English. Has worked on white and colored goods and prints. Is acquainted with every kind of machinery used in his business. Has worked 11 years in this country. Can give good references.

1620 **Bleacher and Finisher.** At present employed in one of the best mills in the United States is open to change. Is well up on white and colored work in cotton, silk and part wool goods.

1795 **Overseer of Finishing.** Has worked on cassimeres, cheviots, beavers, kerseys, unions, dress goods and worsteds, and is familiar with all makes of machinery. Wants $2.50 per day. Age 43; American; married.

1770 **Overseer of Finishing,** or would take secondhand position in large mill. Age 35; married; American. Cassimeres, cheviots, kerseys, meltons, chinchillas, dress goods and cloakings. Is familiar with all makes of machinery in woolen mills.

1771 **Boss Finisher,** or would take good secondhand position. Has worked on all classes of goods. Age 53; Scotch; married. Reason for his wishing to change is on account of mill where he is now employed not running steadily.

1792 **Boss Finisher,** with over 20 years' experience on all kinds of woolen and worsted goods. Learned business in one of the best woolen mills in Scotland, and has also had experience in some very good mills in this country. Strictly temperate and steady, and can give good references as to character and ability. Wants position in a good, steady-running mill at once. Age 38 years; married.

DESIGNERS.

1789 **Designer,** or assistant supt. and designer. An A1 color designer. Can get up good line of fancy woolen and worsted goods which will be good sellers and profitable to the manufacturer. Graduate of a prominent designing and textile school in Germany. Is well posted on all kinds of stock, cotton and shoddy, and with the general work of a woolen mill.

1773 **Asst. Designer.** Age 22; English; single. Fancy worsted, cotton and silk mixed dress goods; serges, shoetops and some double cloths.

1672 **Designer, Overseer of Weaving,** or assistant supt. Age 26; English; single. Has worked in various mills in England and this country. Holds first honors diploma for weaving and designing (London City Guilds). Fancy worsteds, dress goods, colored and fancy cotton goods.

1599 **Assistant Designer.** A young man who is studying woolen and worsted designing would like an opportunity to get practical experience, and will accept very small wages. Has worked in mill for two years as weaver on Crompton & Knowles looms. Excellent references as to character.

1721 **Asst. Supt. or Designer.** Age 27; American; single. Has worked on all classes of colored cotton goods, plain and fancy, and gray goods. Wants $1200 per year, and can take position immediately.

1625 **Assistant Supt. or Designer** on woolens. Has been through all departments of woolen mill and has taken a Philadelphia Textile School course. Practical experience on fancy cassimeres, coverts, hairlines, ladies' dress goods. Very well spoken of. Hard worker.

MISCELLANEOUS.

1735 **Boss Calenderman.** Age 35; English. Is familiar with all kinds of machinery used in bleachery, and has worked on sateens, silesia, cambric, shirtings, sheetings, etc. Wants $3.00 a day. Can furnish references.

1744 **Fixer.** Age 24; American; single. Is familiar with Boss, Invincible, McMichael & Wildman, Brinton, Denny and Victor machines. Wants $15 a week.

1740 **Assistant Supt. and Designer,** overseer of weaving, designer, or both. Age 29; Scotch-American; married. Worked in Scotland and 5 years in this country. Fancy white and colored cotton goods, lenos, lappets, welts, dimities' sateens, Jacquard, towels and handkerchiefs.

1787 **Overseer or Secondhand** of slasning, drawing-in and warping. Age 40. 15 years' experience in a New England mill. Colored work and white work from 18's to 90's. Can take position at once.

1717 **Knitting Machinist.** Age 31; American; married. Is familiar with Lamb, Leighton and Pepper knitting machines; Hepworth and Beattie loopers; Wheeler & Wilson and National button-hole machines; Union button sewing machines; all seamers and felling machines; Singer, Wheeler & Wilson and Standard facing machines. Can take position on two week's notice.

1731 **Young Man of 32 desires to go** to Japan. Is temperate. Been twenty years in cotton mill and has had experience on many kinds of looms, including Draper. Has best of references. Holding a good position in mill now.

1713 **Foreman of Picker Room, or** Painter for some mill and weaver in winter or any other winter work. Wants employment year around. Is an all around man in woolen mill. Has worked on beavers, blankets and fancy dress goods. Wants $2 per day to start.

1746 **Overseer Warping and Dressing,** or weaving, warping and dressing. Has worked on woolens and fancy worsteds. Is familiar with Davis & Furber dressers; Draper, Phenix and Lowell Machine Shop warpers; English plain and Crompton looms. Wants $3 a day.

1762 **Chemist.** Age 23; American. Wants a position in dye works, print works or bleachery. $15 a week to start on. Excellent references.

1764 **Engineer and General Repair Man.** Age 45; American; married. Wants $2.50 to $3.00 a day. Over twenty years' experience.

1765 **Overseer Colored Cloth Room.** Age 48; American. 25 years' experience as secondhand.

1515 **Pay-Master and Shipping** Clerk. Will only work in Southern States. Will accept a moderate salary to begin.

1675 **Bookkeeper and Paymaster.** Age 26; American; single. Has had five years' experience in all in N. E. mills. Not at present employed, and could take position at once. Would start at $12 or $15 a week.

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The undersigned offer for sale at a low figure their property at Frankfort, N. Y. It consists of several acres of land and necessary buildings, together with both steam and water power. A complete tow system of spinning, including card, preparing machines and four spinning frames, also has 50 looms with Crompton & Knowles latest improved dobbies. The plant is fully equipped in all departments for turning out 250 dozen daily of high grade union towels. Can also make superior crashes. Address FRANKFORT LINEN MFG. CO., Frankfort, N. Y.

Master Mechanic and Engineer Wanted.

A man who thoroughly understands an engine and cotton mill repairs is wanted to take charge of power plant and master mechanic's department of a mill in New England. Four or five men under him, but is expected to take hold himself, and it is important that he should thoroughly understand everything about a steam plant. Pay, about $20 per week. Young man preferred. Address EMPLOYMENT DEPARTMENT., Textile World.

EDITOR WANTED.

A prominent Textile Publication (not the Textile World) wants to correspond with parties that are thoroughly competent to take position with such a paper as Editor. Address "TEXTILE," care Textile World, Boston.

HOSIERY FINISHER WANTED.

A Western hosiery mill desires to employ a young man to take charge of the finishing department. Address, D. M., 105, care of Textile World, Boston.

ROLL COVERER.

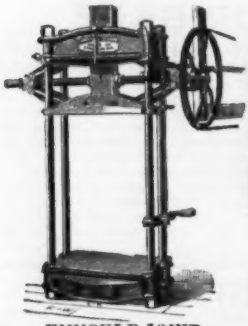
I have done the work for a number of the largest cotton and worsted mills in this country, and am well known throughout the trade. Have been in the business 35 years, and can furnish stock and tools. Would be glad to take piecework, if shop is furnished, or would take a place by the day. Can furnish best of references. **Address 1803, care of Textile World.**

FOR SALE.

Two Altemus Quillers, brand new, never been set up. Apply to Delgado Mills, Wilmington, N. C.

Wanted, A Line of Hosiery.

An experience travelling salesman wants a line of ladies', men's and ribbed hosiery for Georgia and Alabama, to sell to the jobbing and retail trade. Will sell on commission only. Must be a good line and right prices. Good references given. Address, CHAS. A. JORDAN, Dalton, Ga.



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BALING PRESSES

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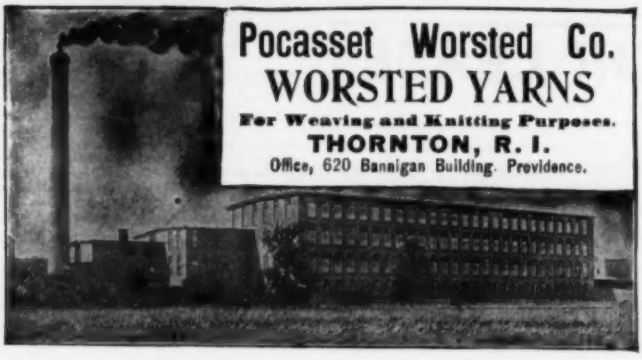
EASTON AND BURNHAM MACHINE CO.,

Pawtucket, R.I.

ALL KINDS OF Spindles USED IN THE MANUFACTURE OF COTTON, WOOL & SILK

IMPROVED UPRIGHT SPOOLERS

TO SPOOL FROM COP, SKEIN, OR BOBBIN.



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WORSTED YARNS

For Weaving and Knitting Purposes.

THORNTON, R. I.

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FLYER SPUN

Mohair and Worsted

YARNS.

Mohair Plushes,

Worsted and Cotton Braids.

D. COFF & SONS, Pawtucket, R. I.

ESTABLISHED 1861.

YARN DEPARTMENT.

The Yarn Market.

Cotton Yarn: The cotton market has changed materially since last report was made. Considerable yarn has been sold at very full prices, but the severe cut on Eastern yarn has demoralized the market and compelled Southern spinners to lower their prices further than the decline in cotton warrants. Spinners generally say, that while there is some difference in the price of cotton quoted, they are not able to buy at the decline. The owners are not bringing it in, and are not offering it.

The weaving trade is very dull.

Knitting yarns are fairly well sold up, although many buyers are holding off, waiting for lower figures. We quote the following, as about market conditions:

Southern frame yarn:

Cones:—

8s and coarser	16 to 16½
9s and 10s	17 to 17½
14s	18 to 18½
18s	19 to 19½
22s	20 to 20½
24s	21
30s	22 to 23
40s	32 to 33

The Eastern list price for mule yarn is about as follows:

Cones:—

10s	18¾ to 19
14s	19¾ to 20
18s	20¾ to 21

Some mills making a superior quality yarn are standing for higher prices.

Warps (single):—

20/1	17½ to 18
22/1	18 to 18½
16/1	16½ to 17
14/1	16 to 16½

Warps (two ply):—

16s	17½ to 18
20s	18½ to 19
30s	21 to 22
40s	26 to 28

Skein:—

8s to 10s	15 to 15½
12s to 14s	15½ to 16½
16s	17 to 17½
20s	17½ to 18
22s	17½ to 18
8/3	14½ to 15
14/2	16 to 16½
20/2	18½
30/2	21
40/2	28 to 30

Woolen Yarn: Spinners of woolen yarn are having some business, but are not running full time, nor is all machinery employed. Mills are anxious to contract for future business on conditions. Some of the spinners are willing to take these orders, but want a guarantee that the mill placing order will take the yarn when ordered. It is getting to be a common practice for manufacturers to place orders, and then if the market goes down or if perchance the goods the yarn is ordered for do not sell, to coolly cancel the order. This places spinners at a disadvantage, and they are getting tired of such business, and especially as it has already ruined more than one spinner. It is believed now that uncertainty is over, and that a steady business will materialize. As it is, the knitters are having a good business, and all of them are short of material, and are buying stock only from day to day to keep the mill going.

Manufacturers declare that they need stock, but would not purchase until they knew how the election is coming out, and that uncertainty over and McKinley elected, these mills will be in the market to purchase extensively.

Some of the knitters not waiting for the settlement of the political question, have been placing orders for yarns and thread waste and other materials, because they have orders which must be filled.

Some of the manufacturers contend that after the election, even that McKinley is elected, there will be no great revival in business, because it is too near the end of the year, and business men and manufacturers do not care to purchase largely at the end of their season, preferring to have stocks as low as possible at inventory time; and again, it is said there is one wool clip practically unsold and another one coming on in April and May.

On the other hand, a large duplicate business is anticipated from orders which have been held back, waiting the settlement of the present political

GERMANTOWN SPINNING COMPANY INCORPORATED GERMANTOWN JAN. 9TH 1890

Frank E. Patterson, Prest. Oscar W. Wood, Treas.

Germantown Spinning Co.

COTTON CARDED

HOSIERY YARNS

In numbers from 6s to 26s.

Germantown, Philadelphia.

W. Warren Thread Works,

SPOOL COTTON

on 100 to 12,000 yd. Spools or Tubes.

A Specialty of Thread for Manufacturers Use

on Spools, Tubes or Bobbins.

Also Seaming and Hosiery Yarns

on Cones, Tubes or Skein.

Our bleaching and dyeing facilities are new and unsurpassed for prompt and neat work. Correspondence solicited.

WESTFIELD, MASS.

The Best is the Cheapest.

It is BETTER and CHEAPER to wind yarn by the "Universal" system before shipment from the mill, thus insuring perfect delivery to knitting machines without rewinding.

UNIVERSAL WINDING CO.,

F. H. BISHOP, Manager.

95 South St., - Boston, Mass.

contest, and we know many large duplicate orders have been placed, provided McKinley was elected. If this be so, and reports and anticipations are verified, these duplicates will find the manufacturers short of materials, and they will be forced on the market to purchase stock.

It is pointed out that there is very little wool owned in Boston. The most of it is held in the West, and is in strong hands, waiting an advance. It is a fact that the small manufacturers of this country have never been known to have such small stocks of raw material as they have at the present time.

Fine wastes of all kinds are in demand, and because of the poor business, spinners and combers of wool, from whom these wastes are secured, have very little of this stock on hand, and in consequence these wastes will have to be procured in Europe.

It may be interesting to know the condition of European markets: Lambs' wools and wools suitable for America, are firmly held; on other classes the market is quiet, with lower prices. The withdrawals at the London sales amounted to 100,000 bales. The total quantity available for the fifth and sixth series was 366,000 bales; the present sale is the last to be held the present year. The pessimism which was rather exaggerated under the apprehension of these sales, has abated, and transactions throughout Europe have been general and important at very firm prevailing prices, which in some instances have been a shade higher.

Worsted Yarn: We are undoubtedly on the verge of a great change for the better in all classes of manufacture; to prove this we have but to note the extensive wool sales during the week ending Nov. 3d, when over 9000 bags scoured wool were sold.

The spinners did not purchase largely of this wool, although they did make some purchases of long staple ½-blood wools.

Many of the leading wool houses withdrew all wools from the market until after the election. This business has been transacted in face of the fact that business was largely held up to await the outcome of the Presidential election. Orders are being piled up in the hands of jobbers, as is proved by the great number of sample pieces distributed by the manufacturers. Said a large handler of men's wear cloth: "There is plenty of business in New York waiting the outcome of the election."

There has been but little clothing

CATLIN & CO.,
YARNS.
67 Chauncy St., Boston
216 Church St., New York.
306 Chestnut St., Philadelphia.

Walcott & Campbell Spinning Co,
IROQUOIS MILLS.
FANCY HOSIERY YARNS
IN ALL COLORS.
New York Mills, Oneida Co., N. Y.

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122 & 124 Chestnut St., Philadelphia, Pa.
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Cotton, Woolen & Worsted Yarns.
All numbers on Hand and Made to Order.

TUCKER & COOK MFG. CO
MANUFACTURERS OF
WHITE AND COLORED COTTON **WARPS**
Nos. 6s to 30s,
On Beams, Jack Spools or in Chain
CONWAY, MASS.

GRANT YARN CO.,
COMBED AND CARDED COTTON.
YARNS 40s and above.
FITCHBURG, MASS. AND **WARPS**

E. JENCKES MFG. CO.
Colored Cotton Hosiery Yarns,
Double and Twist Yarns for
the Weaving Trade.
PAWTUCKET, - R. I.

LINEN YARN IMPORTER.
Hughes Fawcett, 115 Franklin St., New York,
Flax, Hemp & Jute Line and Tow Yarns,
FOR WEAVING PURPOSES
Linen Jacquard Harness Twines.
Fine Cotton Harness and Heddle Twines.
For Cotton, Silk, Woolen and Carpet manufacturers. Correspondence solicited. Samples promptly furnished.

Eddy & Street,
COTTON, **YARNS** WORSTED,
WOOLEN, AND **BRAIDS** SPUN SILK.
PROVIDENCE, R. I.

CAPACITY, 50,000 Spindles.

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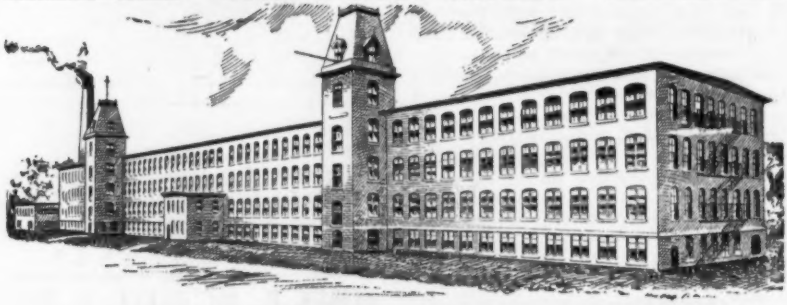

COMBED OR CARDED

COTTON YARNS

In Chains and Skeins, on Balls, Beams, Spools—single or twisted.

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AMERICAN MOISTENING COMPANY,

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The "Drosophore" and "Vortex" Humidifiers.

Legal proceedings will at once be taken against infringers and users of infringements.

WE HAVE, WITH INSTALLATIONS IN HAND, ORDERS FOR OVER 2,000 HUMIDIFIERS.

COTTON YARNS

from 2s to 26s single and ply.

SPECIALTY—FIRE HOSE CORD

and Yarns put up on tubes wound on Universal System.

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INDIAN ORCHARD COMPANY,

Indian Orchard, Mass.

Manufacturers of - - - -

COTTON WARPS AND YARNS

In gray and all colors, single or in any twist.

COLORED COTTON

Machined, Carded or in Roving.

NOVELTY YARNS

In Cotton, Mercerized Cotton, Silk and Worsted, in various Patterns, Colors and Twists.
We are always pleased to assist our patrons of the Woolen Goods manufacture in special pattern warps for samples.
We use a uniform grade of long stapled cotton in all our manufacture.

made up, even in heavy weights, and there are but four weeks left in which to make the winter's supply.

We believe that there will be still a large demand for heavy weight cloth, even at this late date, and there will be a demand for light weights later. The weavers state they have a very limited time to get out light weight cloth before it will be time to start in on the regular heavy weight season again. Hence, if a demand for cloth and clothing comes, which must be the case in the event of cold weather, manufacturers of cloth will have a rush business to get out orders.

Weavers to date have not been placing orders for worsted yarn because they do not know just what their requirements are to be, and when orders are placed even with the prospects of an advance in the price of wool, the weavers will only buy just the exact amount of their requirements. They say they have only a short season ahead of them, and do not want to purchase extensively until after January 1st.

To show the state weavers have reached, a salesman offered a weaver a yarn 13 cents below price by mistake. The weaver would not buy because he had no orders for cloth; but it is a fact that the price named was at least 10 cents per pound cheaper than the yarn could be manufactured for, and there is no wonder users of worsted yarn have been cautious. Said a weaver: "I have just received at my mill several cases of cloth which

DEXTER YARN CO.

Cotton Yarns in Cops, Cones and Skeins; on Beams or Spools, Single and Twisted. Cable Cords and Twines.

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COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps,

Colored and Bleached Yarns Furnished in any manner desired by the trade. **PAWTUCKET, R.I.**

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Manufacturers of

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Mercerized, Turkey Red, Gassed } Cotton Yarns.

Jacquard and Harness Twines.

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Sales in charge of

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The J. R. MONTGOMERY CO.,

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Manufacturers of

Mercerized Cotton Yarns. GIVES THE HIGH SILK-LIKE LUSTRE IN KNIT GOODS AND WOVEN FABRICS

Novelty Yarns. BOUCLE, BOURETTE AND SPIRALS, IN COTTON, WOOL, WORSTED, MOHAIR AND SILK.

Cotton Warps. ON BEAMS, JACK SPOOLS AND TUBES. IN FANCY TWIST COLORS AND PRINTED.

Lace Edgings AND Braids

...FOR...

Knit Underwear

SAMPLES FOR SPRING

1901

ARE READY AND ARE UNUSUALLY ATTRACTIVE

PROMPT DELIVERIES LOWEST PRICES

MONTHLY CAPACITY 30,000,000 YDS.

G. A. Schneebeli & Co.

NAZARETH, PA.

FLEMING & CHAPIN, 229 Church Street, Philadelphia, Selling Agents.

were paid for last April." The last five or six months have been a period of great depression, owing largely to extremely warm weather, the boom and Presidential uncertainty, and the spinners and weavers of worsted yarn have not run machinery more than one-third time.

The present outlook is good, as distributers are nearly all cleaned out of cloth, and must soon place orders. Dress goods manufacturers state that their trade has greatly fallen off, the cause being the declining wool market, as buyers have felt no need of purchasing with the chance of buying each time at a less price.

The boom is largely responsible for the dullness, as many merchants bought hoping for an advance which did not materialize, and are now going to the other extreme and will lose in being too conservative.

The spinners state that the nearer manufacturers get to the yarn, the cheaper is the price, that it is possible to buy certain grades of tops cheaper than the wool can be purchased.

Spinners were anxious for sales for October delivery, and made very low prices to tempt buying, but no business came of it, as weavers would not purchase at any price, and now when they are ready to place a few orders, they find that spinners no longer will make the reductions of October.

A finer class of yarn is going to be used the coming season, and stripes are going to be largely in style. Weavers have been urged to buy, as it is claimed that within 90 days prices for worsted yarn will advance from 5 to 10 cents per pound.

French yarn spinners, while running slack, have more orders on hand than the English spinners, and the knitters of hosiery are beginning to call for bids on next season's work, and will soon place orders for deliveries after January. The spinners are making prices on the previously low prevailing prices of wool which they will be unable to carry out, in case of advance in raw material.

Manufacturers of tops have been doing but little business, but orders are beginning to go forward, and a good business is anticipated. There is an undoubted upward tendency, which will increase as the first of the year is neared.

Freight Rates on Belfast Linens.

The freight rates on linen goods from Belfast, Ireland, to points in England, are so high that the president of the Flax Association believes it would be cheaper to ship the goods by steamer to New York and return to England. The time consumed by the latter route prevents it from being used.

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MANUFACTURERS OF
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HERBST & JONES,
KENNEBEC WORSTED MILLS.
Successors to Kershaw Worsted Co.
WORSTED YARN SPINNERS,
21st & Naudain Streets.
PHILADELPHIA.

RICHARD CAMPION,
Selling Agent for—
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Woolen Yarns.
Main and Walnut Sts., - - Manayunk, Pa.
Correspondence solicited.

YARNS
SOLIS : : BOSTON.
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ANDREW J. SOLIS, Jr. & CO.

HOWLAND CROFT, SONS & CO.

LINDEN WORSTED MILLS.

Fine Worsted Yarns

OFFICE AND MILLS:

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Represented by FIRTH BROADHEAD,
937 Banigan Building, Providence, R. I.

ALLEGHENY WORSTED MILLS,

Thomas Wolstenholme, Sons & Co., MANFRS. OF

Worsted YARNS,

ALL NUMBERS SINGLE AND TWO-PLY,

Sell Direct,

on Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural & Fancy Mixes.

Office and Mills: Frankford Ave. and Westmoreland St., Phila., Pa.

CRANSTON WORSTED MILLS.

Worsted and Mohair Yarns—white or colors, in skeins, on spools, cones, or shuttle bobbins.

NOVELTY YARNS—of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making Yarns **only.**

CENAPPED YARNS of all kinds. Doup Yarns. Harness Yarns. For Braids, etc.

...Dyers of Yarn and Slubbing...

BRISTOL, R. I.

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Worsted Spinners.

Yarns, both French System and Bradford.

Knitting Yarns in all Grades and Mixes.
All Numbers to 60s.

21ST STREET AND WASHINGTON AVENUE, PHILADELPHIA.

MALCOLM MILLS CO.,

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Novelty Yarns, Silk Noil Yarns, in Fast Colors AND White.

Mills, Frankford, Pa. Office, 220 CHESTNUT ST., PHILA.

Piece or Yarn Dyed Mixtures.

A process patented in France for producing woolen mixtures without the necessity of dyeing the different shades separately and then mixing them together, consists in mixing natural wool with wool that has been prepared or mordanted for dyeing. This mixture is then manufactured into yarn or cloth, and when dyed the mordanted and unmordanted wool take different colors.

It is difficult to see any advantage in this process, as it saves no time or labor, and it is doubtful if the mordant would retain its efficiency through the different processes of manufacture, and during the long time which would elapse before the wool was dyed.

Electrolytic Bleaching of Baled Yarn.

A packing process for yarn has been invented in Dresden, by means of which the yarn may be bleached without undoing the packages.

The bundles of yarn, each weighing 5 or 10 lbs., are placed in the vat, in layers, and in a vertical position. The circulating fluid moves in the direction of the threads, thus, it is claimed by the inventor, rendering possible, a perfectly spotless bleaching.

Improved Hand Loom.

It occurred to a French hand-loom weaver in the commune of La Gaillarde, that the strength he expended in operating one loom, would, if properly applied, be sufficient to operate two; so he placed two hand-looms opposite each other, connected the two lays by a jointed lever, and also fastened the treadles together. In this way, by pulling the lever, he worked both lays, and at same time, his foot moved the harness of both looms by pressing one treadle.

This arrangement worked so successfully that the Industrial Society of Rouen is considering the advisability of awarding a silver medal to the inventor.

WAVERLY WORSTED CO.
SPINNERS OF
WORSTED YARNS
FOR WEAVING AND KNITTING.
Main St. & Green Lane, Manayunk, Philadelphia.

C. MOORE & CO.,
MANUFACTURERS OF
TWINES, THREADS AND YARNS.
Jacquard Harness Twines of all kinds on hand and made to order.
S.W. COR. FIFTH & MARKET STS.,
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Philadelphia Wool Scouring
AND Carbonizing Company.
Fine AUSTRALIAN NOILS a Specialty.
Correspondence Solicited.
JOHN LUNN, Pres. & Mgr., 107 Erie St., Camden, N.J.

SILK NOILS AND SILK NOIL YARNS
IN WHITE AND COLORS.
MOHAIR LOOPS, KNOTS, AND FANCY YARNS FOR DRESS GOODS AND CLOAKINGS.
A. T. SKERRY & CO., 47 LEONARD ST., NEW YORK.

Weaving and Knitting Yarns.
Sanitary and Fancy Mixes
Wolstenholme & Clark,
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FRENCH SYSTEM.
Mills, Baker and Mallory Sts.
No. Manayunk, Philadelphia, Pa.

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CLOBE DYE and BLEACH WORKS,
Frankford, Philadelphia, Pa.
Dyers, Bleachers and Mercerizers of Warps and Skein Dyeing.

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SILK MANUFACTURERS.

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Knitting Silks, Ribbons AND Piece Silks,

USED FOR TRIMMING KNIT GOODS.

TRAMS, ORGANZINES and SPUN SILKS, in the Hank, or on Spools or Cones, for Manufacturers' Use. Silk for Special Purposes Made to Order.

MILLS: South Manchester and Hartford, Conn.

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DEALERS IN

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Foreign and domestic

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Importers of European and Asiatic Raw Silk.

54 Howard St., cor. Mercer St., - NEW YORK.

THE SECRET of our popularity is no secret to our customers Experience has taught them that we give them better work and better service than they can get elsewhere.

T. BROPHY'S SONS, Jasper Street above Clearfield Street, PHILADELPHIA.

Dyers of All Kinds of Yarn and Cotton Warps.

ATLAS FOUNDRY & MACHINE CO.,

SUCCESSORS TO **ATLAS MFG. CO.**

Manufacturers of

Wool Burring, Picking and Mixing Machinery, PARKHURST DOUBLE CYLINDER BURR PICKERS, Steel Ring and Metalic Burring Machines and Feed Rollers, Etc.

OLD METALIC BURR CYLINDERS COVERED WITH STEEL RINGS Self Feeders for Pickers and Cards, Picker and Machine Brushes, Atlas Improved Side Drawing Machines and Creel.

INQUIRE ABOUT OUR NEW AUTOMATIC WOOL DUSTER.

BELLEVILLE, N. J.

PROVIDENCE DYE WORKS.

Dyers and Finishers,

COTTON YARNS, Suited for HOSIERY and WEAVING Cotton, Woolen and Worsted DRESS GOODS, Woolen and Worsted Mixed CASSIMERES and CLOAKINGS, also Woolen and Worsted Slubbing, COTTON YARN and WARP DYERS and BLEACHERS.

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OFFICE WITH BLODGETT & ORSWELL CO., Manufacturers of Glazed Yarns,
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Satisfaction Guaranteed.
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ESPECIALLY FOR THE **Knit Goods Trade.**

Give Us A Trial.

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SCHUYLKILL HAVEN, PA.

HOME BLEACH AND DYE WORKS,

PETER B. McMANUS, Proprietor.

Dyers and Bleachers of Cotton Yarns,

PAWTUCKET, R. I.

The Wm. H. Lorimer's Sons Co.

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DEALERS IN
MERCERIZED COTTON YARNS
All Numbers Up to 140s. 2 Ply in Combed Peelers, Egyptians, & Sea Islands . . . . .

Ontario & Lawrence Sts.,
Philadelphia, Pa.

FAST COLORS

For Wool, Woolen and Cotton Yarn and Piece Goods Dyeing, and for Calico Printing

ALIZARINE RED, PASTE AND POWDER.

Alizarine Blues, Oranges, Browns, Yellows, Maroon, Gray and Black.
Cœruleine, Galleine, Mythylene Grays.
Thionine Blues, Thionine Indigo, Solid Green and
PATENT BLUES (superseding Extracts of Indigo on account of fastness and color bloom) for Wool and Silk, Benzidine and Primuline Colors, Zinc Dust, Aniline Salts and Oil.

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Cottons and Linens.

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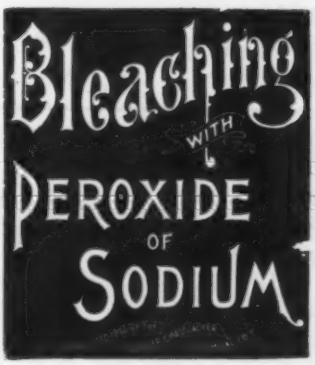

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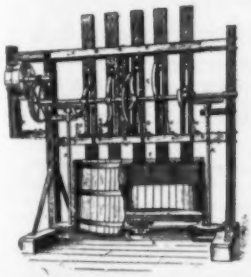

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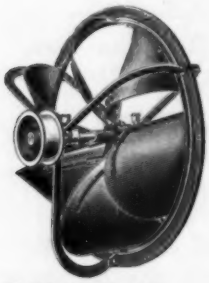

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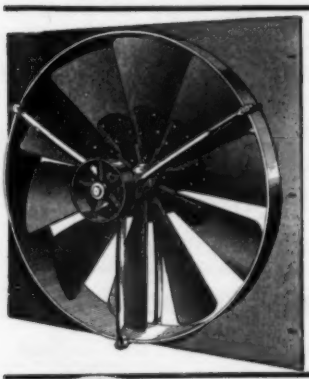

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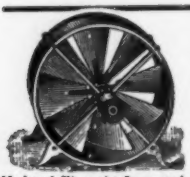

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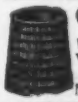

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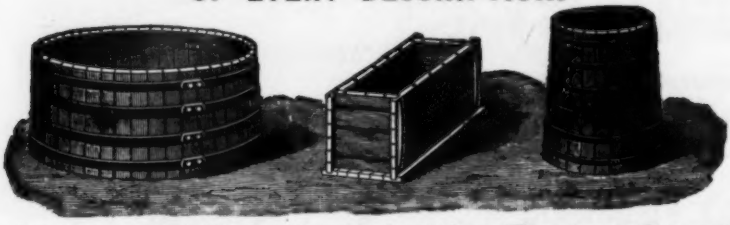

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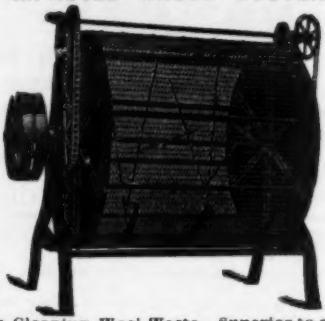

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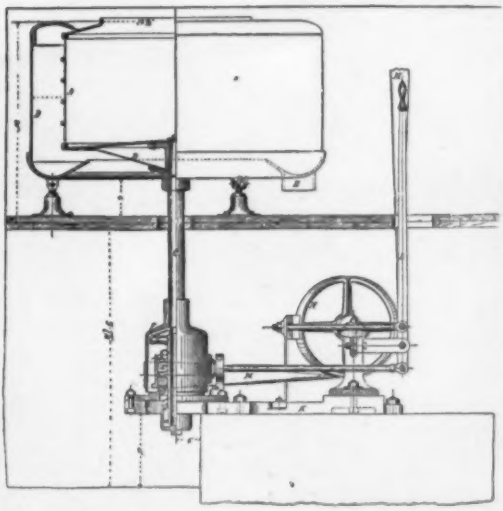

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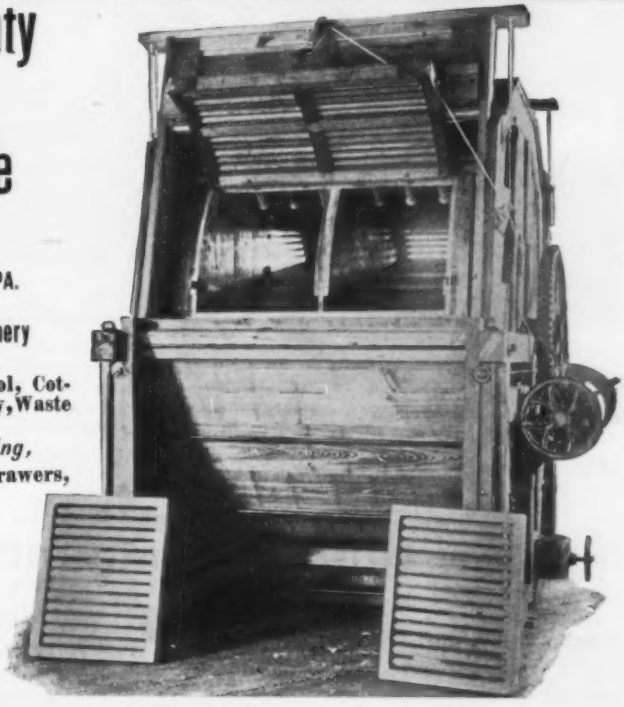

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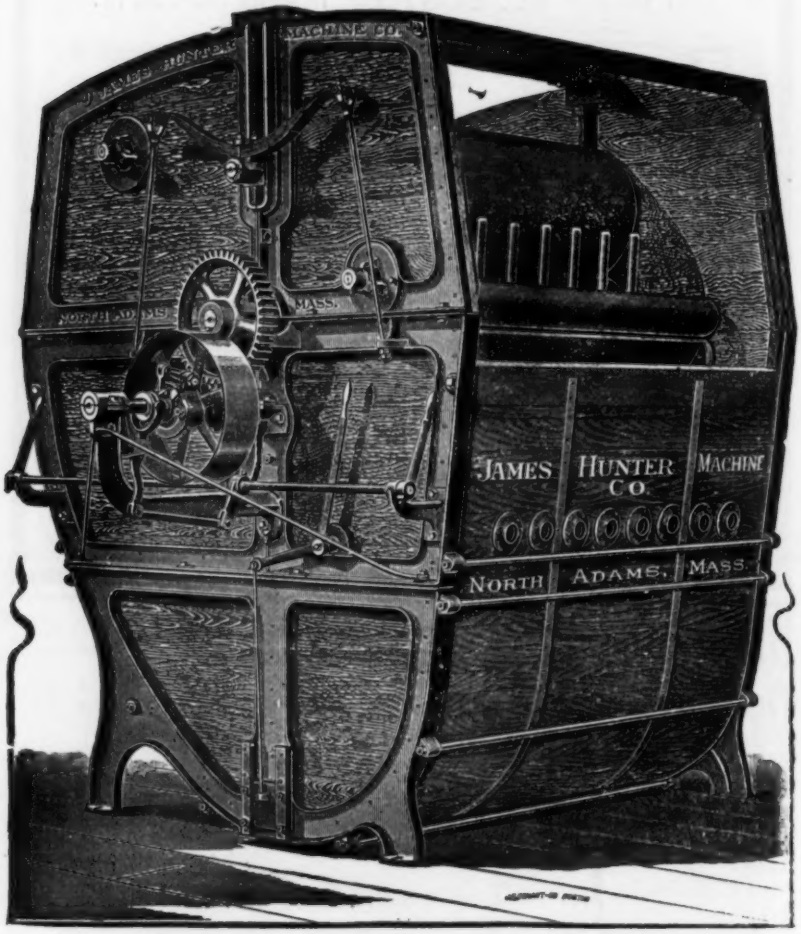

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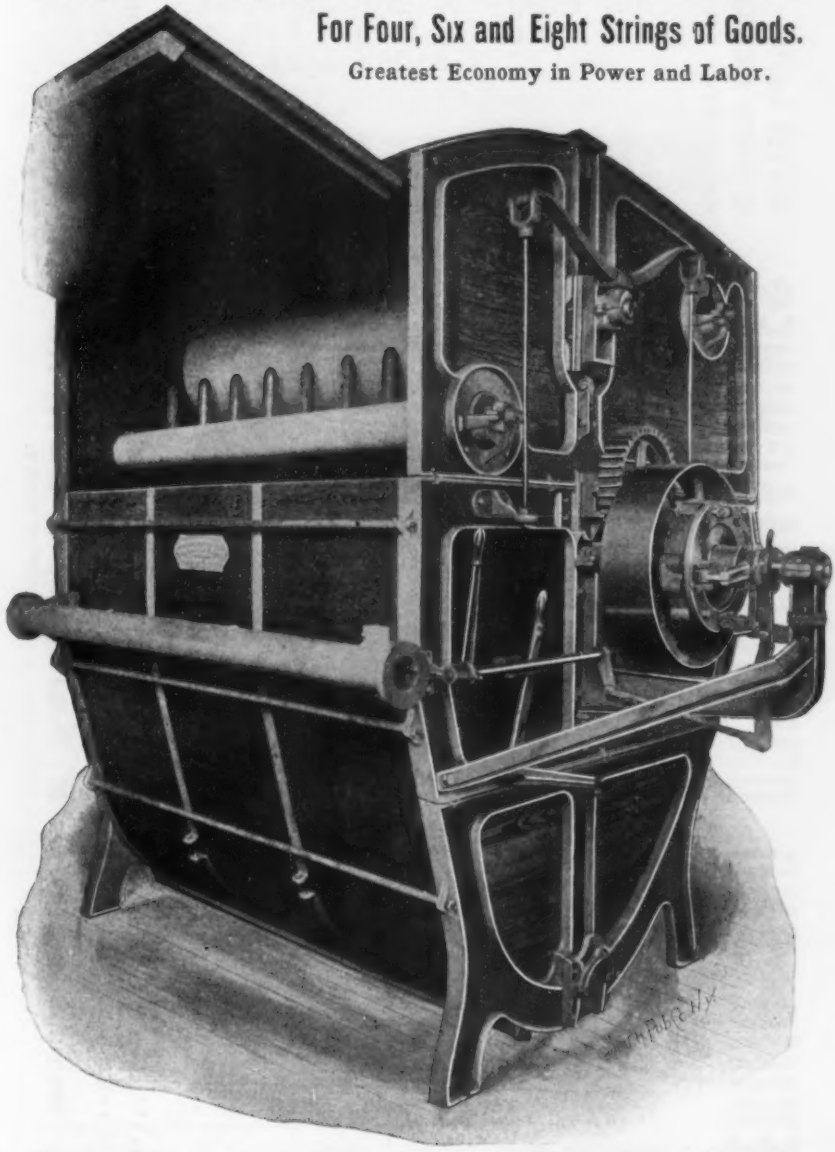

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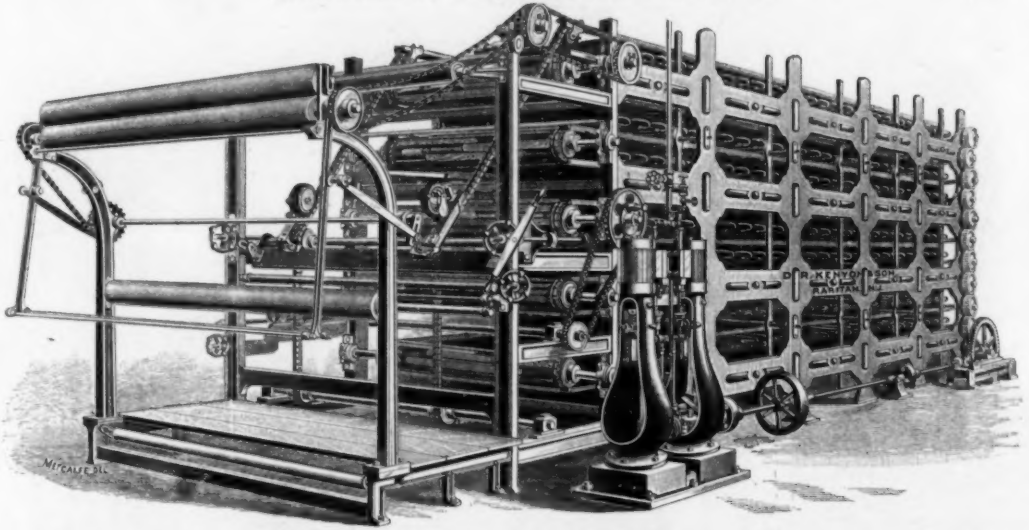

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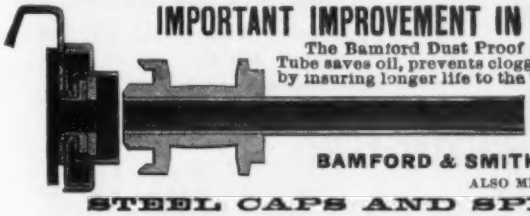

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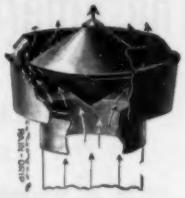

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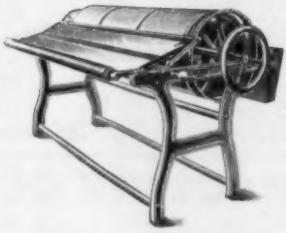

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For Wool Scouring, Renser Boxes and Dyers of Raw Cotton.

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In knitting "string work," **a loose course** is put in as a guide for cutting off each stocking. **A loose course can be put in for looping** the toes. This is a great advantage in fine gauges.

Attention is invited to the new method of transferring tops to the needles of machine in knitting Half Hose, and in footing ribbed leg hose.

The method of doing this is entirely new, and must not be confounded with the ordinary method of transferring with a quill ring.

The speed of the machine is reduced just before changing from circular to reciprocatory knitting, thus avoiding all shock. All parts are interchangeable.

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The Invincible is a compact, light running, full automatic machine, simple in construction, has few parts runs at high speed, occupies small space, and is put upon the market at a price that defies competition from either full or semi-automatic machines.

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Men's Underwear, Sweaters, etc.

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Machines for Rib Hosiery, Rib Tops and Cuffs.

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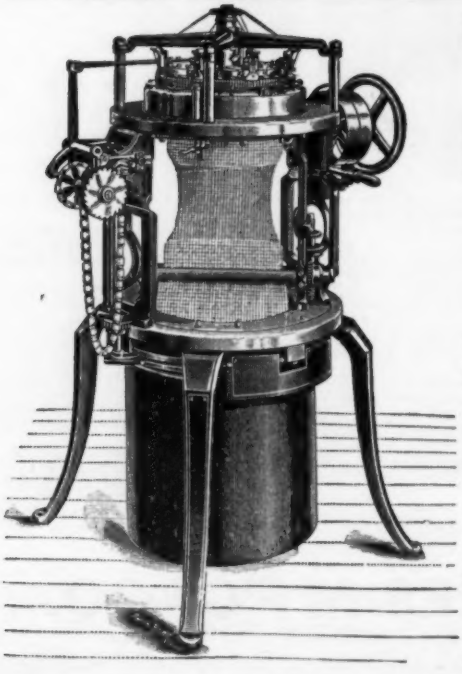

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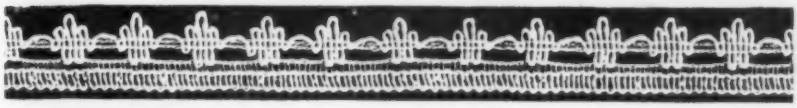

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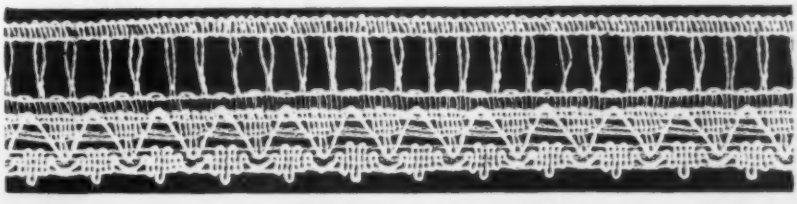

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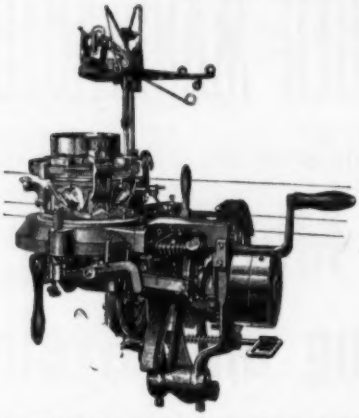
One-half, Three-Fourth or



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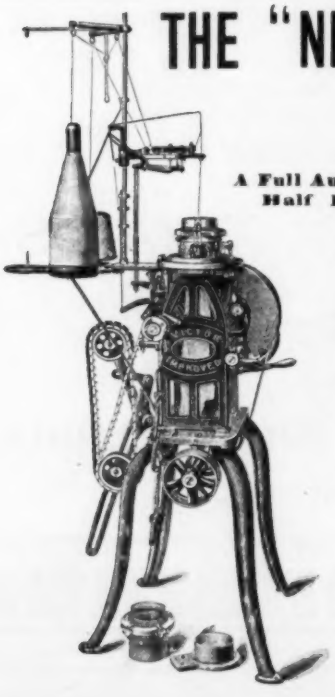

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Automatic Yarn-Changer and Plaiter and High Splicer Readily Applied.

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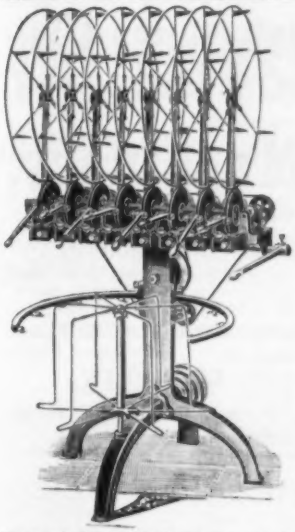

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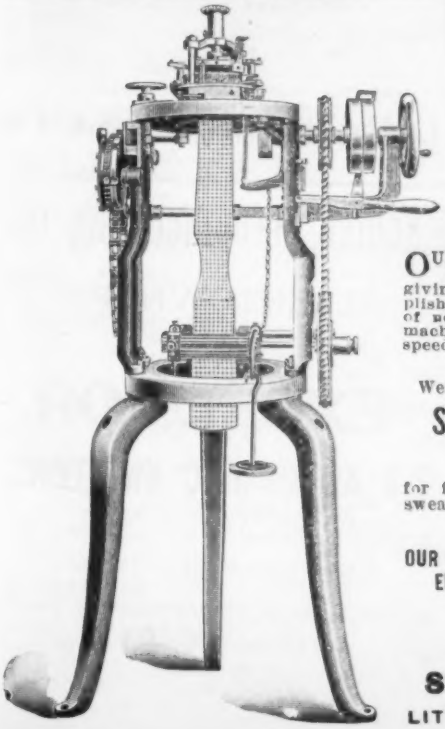

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OUR latest model machinery has been designed to run at **very high speed**, giving large production. This is accomplished with fewer seconds, less breakage of needles, less jar and wear and tear on machines than has been customary at lower speeds.

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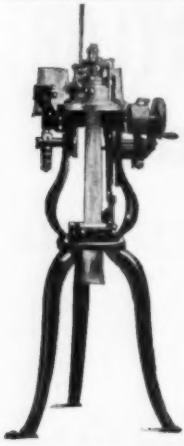

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Manufacturers of

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Automatic Welt and Loose Course Machine for Sock Tops. New Circular Stripes with Welt, Loose Course and Striping (Automatic), for Shirt Cuffs, Sock Tops, Hose Legs, Wristers, etc.

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All kinds of

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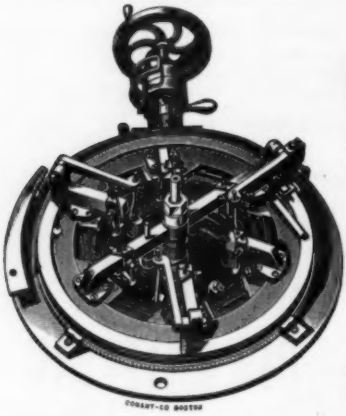

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Either plain or full automatic, with stop motions complete, for

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The Leighton Circular Machines are the only ones which **Rack** or **Shog** the needles for fancy borders; also built for automatic striping; and with from 4 to 16 feeds for underwear.

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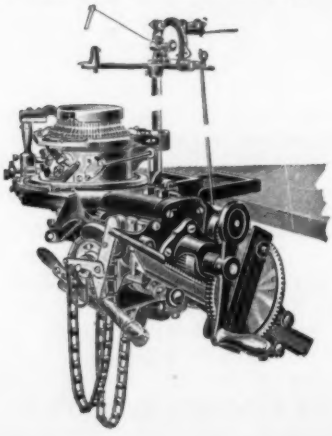

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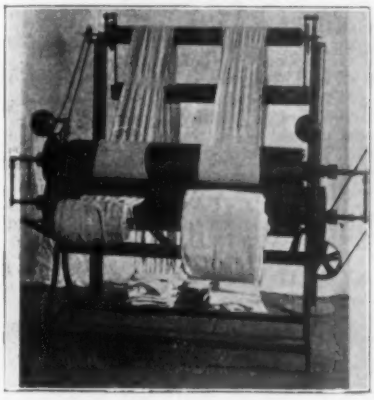

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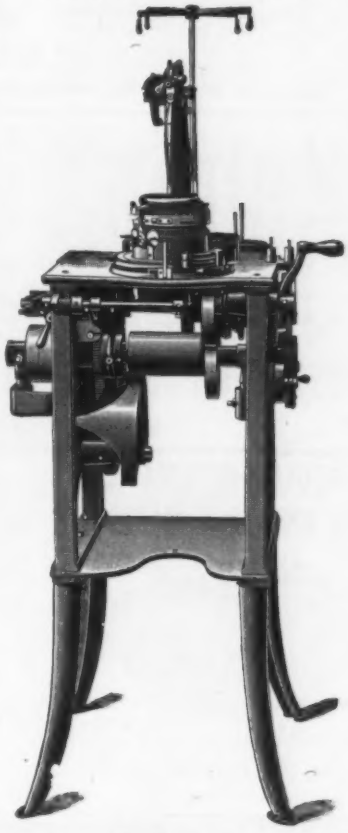

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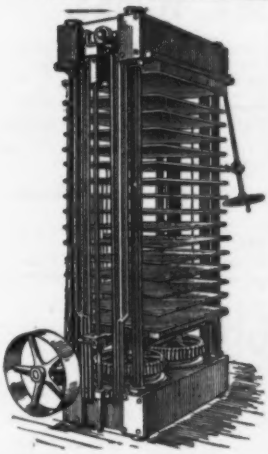

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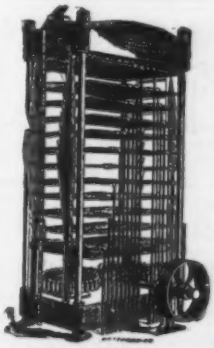

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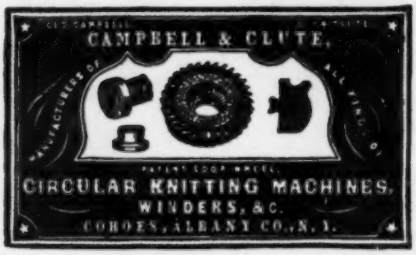

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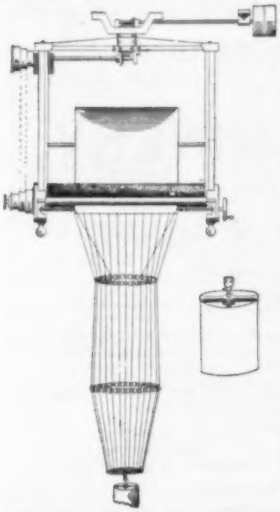

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Parts for Wilcox & Gibbs Mfg., and all Sewing Machines.
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Manufactured by
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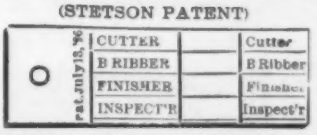

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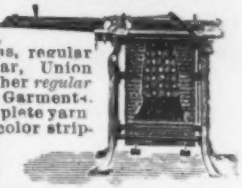

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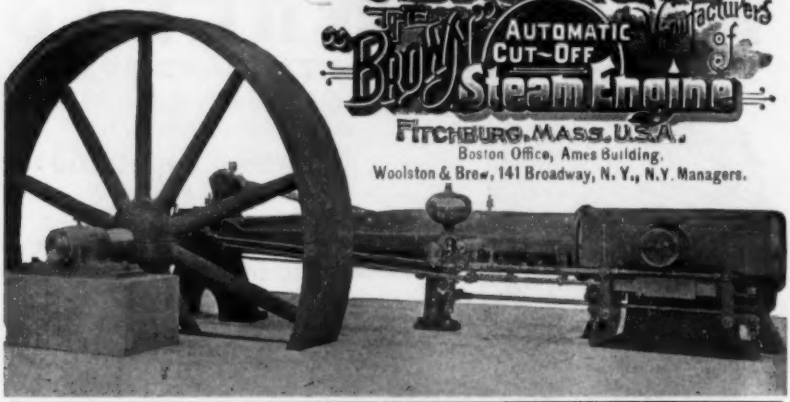

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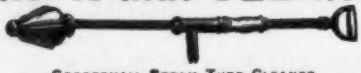

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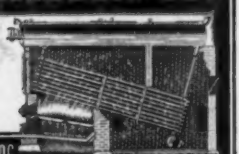

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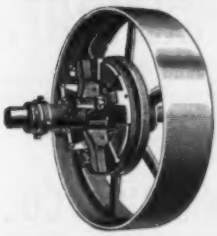

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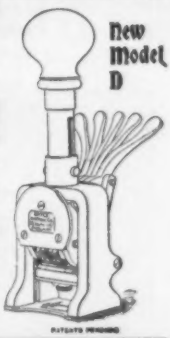

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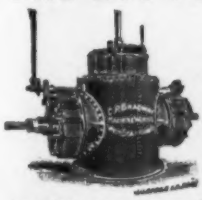

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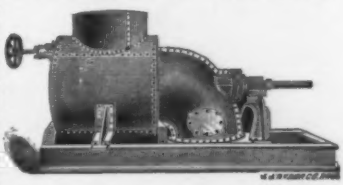

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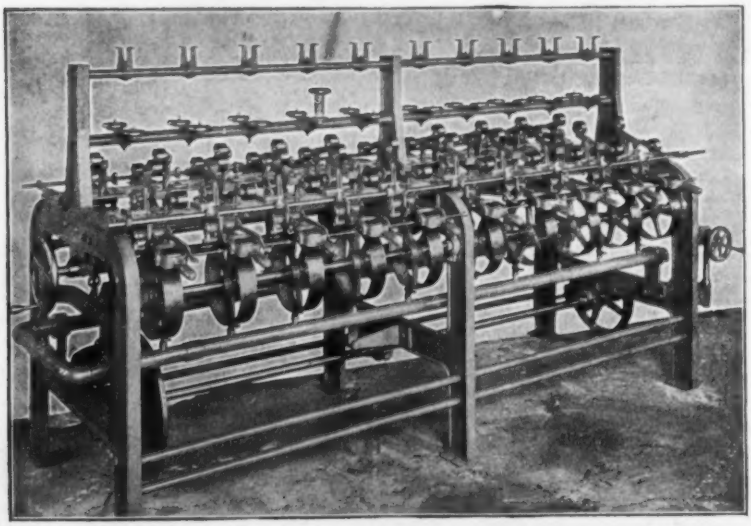

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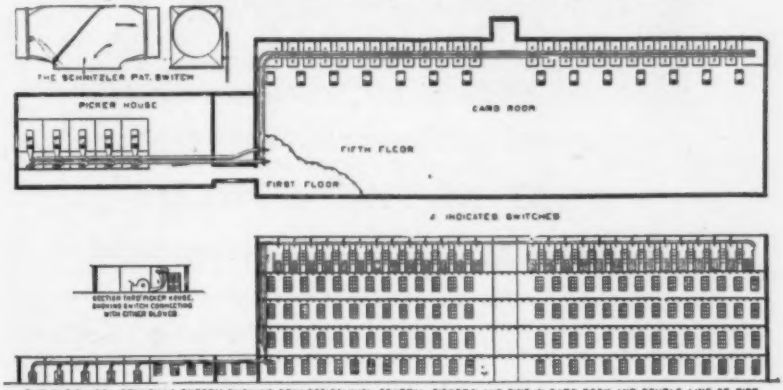

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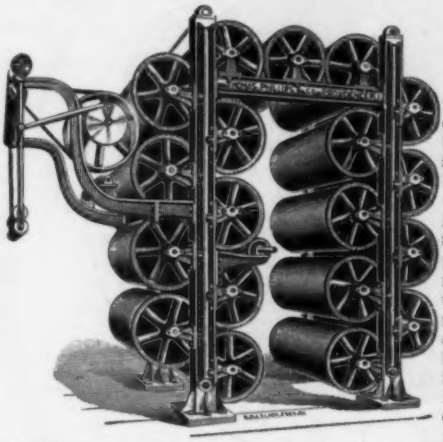

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